

2004

EDU-COM 2004 International conference: new challenges for sustainability and growth in higher education

John Renner (Ed.)
Edith Cowan University

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CONFERENCE SPONSORS AND ORGANISORS

Edith Cowan University

The University is named after Edith Dircksey Cowan, OBE JP, who in 1921 was the first woman to be elected to an Australian parliament. Her achievements included a significant contribution to the development of education, particularly in government schools. The university has positioned itself as a professional oriented tertiary education institution, providing service to and preparation for the professions. Areas of strength include education, nursing, creative & performing arts, and the knowledge based industries of finance, business, computing & communications.

Khon Kaen University

Since its foundation in 1964, Khon Kaen University (KKU) has been the leading educational and research institution in North-Eastern Thailand. Located at the heart of the poorest and least developed region in the country, the University strives to prepare its students so that they can make a positive and active contribution to society. The goal of the University is thus to educate students so that they not only have in-depth understanding of their chosen specialisation, but also have a broad academic knowledge of other issues. Khon Kaen University places a great deal of emphasis on academic collaboration with overseas universities. Khon Kaen has formal agreements with institution across four continents.

Bansomdejchaopraya Rajabhat University

Bansomdejchaopraya Rajabhat University (BRU) was originally established in 1896. BRU has represented quality and longevity for more than a century. Over the years, the University has grown and developed into a prestigious institution. As a public tertiary educational institute for community development, BRU holds to the principle of education for all, aims at improving the quality of life of the local people, and seeks to increase the educational qualifications of working people, as well as expanding educational opportunities for secondary school graduates. BRU's mission is to develop the community, conduct research activities, give academic public service, provide appropriate technology, conserve the arts and culture, promote teachers' qualifications and produce qualified teachers as a human resource for the country.

FOREWARD

EDU-COM 2004, an international conference held in Khon Kaen, Thailand from the 24th to the 26th November, 2004 took the theme: New Challenges for Sustainability and Growth in Higher Education. EDU-COM 2004 was sponsored and organised by Edith Cowan University, Khon Kaen University and Bansomdejchaopraya Rajabhat University/

The Conference was structured to address five sub-themes pertinent to the challenges facing higher education worldwide:

- Collaboration between campus and community in Higher Education
- Collaboration targeting multi-cultural and cross-cultural issues in Higher Education
- Collaboration through new teaching and learning technologies in Higher Education
- Collaboration for quality: valuing and evaluating performance in Higher Education
- Collaboration for effective governance in Higher Education

Contributors were invited to address on or more of these sub-themes. All papers published in these proceedings reflect the drive for richer learning experiences, improved learning environments and recognition of the importance of the local community as technology enables us to think globally. Predictably perhaps, e-education brought the most substantial response, a clear indication of the perceived potential for new technologies to influence teaching, learning and administration in higher education. The papers also highlight some of the challenges and emerging expectations for higher education in a world that is increasingly characterised by international alliances, partnerships and tensions – a search for sustainability and equity in a period of rapid social and technological change.

The Proceedings are in 3 sections. Section 1 – Keynote Speakers; Section 2 – Academic Peer Reviewed Papers; Section 3 - “Work in Progress”.

EDU-COM 2004 was attended by delegates from Australia, Botswana, Cambodia, China, Denmark, England, Hong Kong, Iran, Ireland, Japan, Lao, Myanmar, Singapore, Tanzania, Thailand, Vietnam,

The opinions expressed in these Proceedings are those of the respective authors.

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Abusalem, A. Central Queensland University, Australia. Cultural Competency From The Perspective of Australian International Students.

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Abstract

International students are attracted to Australia as a study destination for a variety of reasons including our multiculturalism; however they often become frustrated when their perceptions and expectations of the Australian educational experience are vastly different from reality. This is despite efforts ensuring a smooth transition process for example: ongoing support, guidance and counselling for prospective students, certification of qualifications/credentials, visa processing, accommodation advice, and pre-departure briefings (IDP 2004). Student representatives find issues relating to cultural differences and misunderstandings often pervade educational delivery, policies, procedures, systems, and student understanding for example: academic misconduct; plagiarism; English as a second language; medical certificates; health care cover; integration with domestic students; students at risk; government regulation and policy (NLC 2003). Studies have also shown that international students have difficulties interacting with Australian students and staff on campus as well as the wider Australian community (for example Smart, Volet & Ang cited in DEST 2003). The authors propose that research is required in relation to cultural interactions (and impacts) between international students, their service providers and the broader multicultural Australian community using a cross-cultural approach based on an assumption that Australia's commitment to multiculturalism and cultural diversity includes the understanding and instigation of the basic principals of cultural competence. This presentation considers how research conducted from the perspective of international students would highlight areas of concern and also identify potential paths to cultural understanding and development for higher education institutions and related service providers.

Introduction

There are approximately 300,000 international students in Australia, overall representing a significant contribution to the Australian economy. So huge, that the Australian government is now accustomed to referring the international students' market as an 'export commodity'. When there are new emerging trends of students from certain countries/regions, the influx more often than not equates to the dollar value each student can bring in to the country. Nelson (2003)

This trend is only likely to increase given the Australian government's continual reduction of real funding to Universities and the pressure to fund activities from commercial enterprises.

The lack of acknowledgement and the realisation of improved service, which constitutes a fundamental reason for these students to be attracted to Australia as their study destination, more often than not, frustrate the students who have different expectations before and after they arrive in Australia.

Deciding to further take on tertiary education is a daunting enough exercise for students in general, let alone if you are international students. Due considerations must be given to visa application, financial affordability, choice of institution, and accommodation among many other things. This complex decision tree is acknowledged by the international education industry, especially by the University. Various efforts are put in to 'ensure' that there is a smooth transition process for international students to 'assimilate and adapt' with the Australian environment. However, many question the motive behind such shift. Is it

genuinely to address the isolated problems that international students face, or is it more of a marketing gimmick to show 'prospective' students that the University is 'genuine' in its efforts to address the looming problems of international students.

Darwish (1988:17) argues that education is not simply a process of accumulating or assimilating information, but also a process of assimilating methodologies, thought patterns, ideologies, scientific approaches and above all social values. Consequently, international education plays a major part in changing or rather "globalize" the perspective of international students.

Regardless, the process of identifying what ought to be the problems are the difficult one. Apart from it, prescribing a solution to deal with those problems is by the same token, arduous. There is only one way to tackle this: ask the international students directly.

When it comes to international students representations in Australia, similarities can be drawn with oil as scarce resource. There are limited number of international students interested enough to represent their peers in fighting for issues that concern them the most. Because of these scarce resources, the one who have self-identified themselves as international students representatives, are more often than not, overburdened. This set as an unpleasant example for others who might have the first hunch to be international students representatives.

- (a) Therefore, cultural competence is a set of complimentary behaviors, attitudes, and policies that help systems, agencies, and professionals work effectively with people of different cultures.
- (b) Culturally competent services are systems, agencies, and professionals that have the capacity, skills, and knowledge to respond to the unique needs of people from different cultures
- (c) According to the U.S. Census Bureau, as of July 1, 1998, minority groups (Black, American Indian, Eskimo, Aleut, Asian, Pacific Islander, and Hispanic) represented approximately 25% of the population. By 2050, these same ethnic groups are projected to account for more than 47% of the population. To provide the best care possible, the health care and service delivery industries must offer services that are sensitive to the needs of people whose cultures differ from that of what can be called mainstream America.
- (d) A person's culture influences their values, thoughts, feelings, and the way they respond to people and situations. For example, in many cultures physicians and other health practitioners are held in high esteem and their opinions are respected. However, if the health professional is not indigenous to the culture being served, there
- (e) may be a lack of trust of the provider. This lack of trust may hinder the person or family member from seeking necessary treatment, counseling or accessing services.
- (f) Health care, rehabilitation, and other service providers will need to consider how different beliefs might effect treatment and develop strategies, protocols or policies that ensure quality care is administered to everyone.
- (g) Although each employee should take the necessary steps towards cultural competence (e.g., learning more about traditions affiliated with other cultural groups), cultural competence is the responsibility of the entire organization.

According to Professor Simon Marginson (2003) "Australia commands 2% of world GDP and 2% of research output. It is not the dominant world power. It is a developed nation with areas of global strength". He argues that for Australian universities to be global players in the international education and provide first class education they need first class public funding.

Overall, the reputation of the Australian higher education is crucially important to the international education industry. With qualifications widely recognised outside Australia, the student has received value

for the money they have invested in their education in Australia, thus improving the reputation of the Australian education industry.

Therefore, NLC- the National Liaison Committee for International Students in Australia- the peak representative body for international students currently studying in Australia realises the importance of this reputation outside Australia; the recognition of the qualification the student acquires in Australia is dependent upon both the quality of education and the reputation of the international education industry and the institution. The 20th NLC National Education Conference 2nd - 4th of July, 2005 at the Newcastle University, has the theme International Education " Beyond the Marketing Hype": the reality in valuing diversity, which embraces important issues discussed in federal Minister's Brendan Nelson Ministerial statement 'Engaging the World through Education';

“The Australian Government believes that education makes a critical contribution to the personal well-being, social and economic development and national security. International education contributes to Australia's engagement with the world, socially, culturally and intellectually as well as economically. Education provides the foundation knowledge and essential skills for an increasingly mobile international workforce.’ Nelson (2003a)

Quality and integrity of Australian education, recognition of Australian qualifications and the benefits of internationalised education. The NLC understands that the Australian Government is working extremely hard towards ensuring in every way that international students receive a globally competitive standard of education in Australia, by providing a quality assurance framework and the body AQUA in the Higher Education Sector to maintain this high standard.

Quality through Diversity

Australia is increasingly becoming a popular destination for international students particularly from Asian countries and the Middle East. This is attributed to the geographical proximity to Asian countries, language, reputation and flexibility of study and work arrangements. Hence, Australia can capitalise on these strengths furthermore if more effort is invested in the educational sector particularly higher education, considering the value of differential fees for international students as away to enhance existing resources available for students and gaining independence from government funding.

There is strong evidence that the educational sector in Australia has extensive offerings and potential to international students. Educational institutions in the last decade became only more conscious of the value of international students monetarily. Nevertheless failed to subsequently recognise the need to internationalise education to cater for the needs of international students.

The post-secondary education sector in Australia has much to offer the international students; hence we are facing a highly competitive environment whereby education is dealt with as a commodity. The critical question to be asked whether we are providing international students with the level of education and services expected in return for higher educational fees. From my own experience and one-to-one interviews with international students, there were many concerns raised across all international students

Cultural Adjustment

This is an introductory stage that occurs once they arrive to Australia. The majority of the students particularly those who have no relatives or friends to support them during this transitional period find it extremely hard to adjust to the new culture. This factor is disguised by their worries and concerns about studies requirements, teaching and delivery style, study workload, the adaptation to university resources and systems including the use of new technologies within the universities, locating educational resources.

In addition the issue of social interaction with Australian students is a major concern to them at this stage. It is obvious at this stage that international students tend to group to provide a supporting mechanism to each other.

During teaching sessions, international students tend to be quite, shy and embarrassed to ask and inquire about any issues they feel ambiguous to them. This is due to fear of personality judgment by their colleagues and lack of confidence in their language skills. It is noticeable that the theory, lecture and literature material is difficult for them to conceptualise in terms of readings and comprehension.

Cultural awareness and preparedness about Australia and particularly Australian Educational Institutes is a critical success factor to eliminate the length of this dilemma for these students.

The lecturer/tutor role is very important to further encourage interaction within the class highlighting the benefits to them in terms of improving self- confidence, language and understanding of the subject. It is also important to assure them that it is acceptable and highly desired to voice out their thoughts, fears and concerns. Training and education should be provided to lecturers/teachers to improve their teaching ability and skills in a cross-cultural environment.

Language and Communication Barriers

Most of the international students particularly those coming from the Asian region confront major difficulties of reading and writing in English and comprehension skills. There is a substantial time consumed by those students to understand terminology, expected learning outcomes and what is required of them to deliver in terms of performance and assignments. Students find it extremely hard to understand theories or text material assigned for their readings. This is clearly reflected in their result for the first piece of assessment.

International students at their early course of study are very reluctant to clarify the tasks assigned to them due to the cultural adjustment factor discussed above. It is noticeable that they tend to ask other international students for further clarifications to piece the puzzle together, which creates a lot of upheaval and misinformation as each understands the requirement differently.

These difficulties in language and communication require teachers to exert tremendous efforts in their choice of words, reliance on the use of familiar and common vocabulary and pace of speaking needs to be slower and clear. This strategy will enable teachers to distinguish between international students with language difficulty and those with learning difficulties.

System Complexity

Most of the international students coming to study in Australia live in countries where technology is not at an upbeat stage in comparison to Australia. They find it extremely difficult to adapt to the new technologies available within the universities and absorb how the system works in their institutes. If we include this factor to the cultural shock, anxiety, language problems and homesickness it definitely contribute a great deal to their existing problems. The pace whereby they are required to adjust to system complexity is relatively tight, as they are expected to know how to use such technologies and resources.

There should be a proper and intensive orientation program, whereby students are taught how to use such technologies and systems. A printed booklet including all these information would assist significantly for future references.

A good mentoring program should be established by the universities, which include international students from the same country and local students to participate in new students orientation programs.

This is a great opportunity for the new students to have a comfortable kick-start, release their fears and anxieties to those who already went through their experience. It is also a great opportunity for them to establish networks from local and international students. Mentors should be given incentives in participating in such activities such as book vouchers and discounts on their fees.

Methods of teaching and Learning Styles

It is evident that there is a distinct difference between teaching and delivery style in Australian universities in comparison to those methods used in Asian countries.

International students are used to receive information from their teachers without the space to discuss or explore other concepts. Students are used to a learning environment that doesn't foster interaction and critical analysis of material delivered. It is prevalent that their learning style relied heavily on memorising and recalling information rather than conceptualisation and comprehension.

The challenge facing educational institutes in Australia is how to ride the wave to ensure a smooth transition from a passive to an active learning method that rely on critical thinking, analysis and deriving creative and innovative problem solving techniques. They need to be supported individually and face-to-face at their early stage of education to boost their confidence and settlement in the educational system. However, this is time consuming and requires lecturers/teachers workload to be adjusted to accommodate such needs.

Resources

Australian universities lack the availability of enough resources that cater for the needs of international and local students. The resources include library resources such as books and journals. There are a limited number of copies available within the library, which doesn't meet the increasing and competitive demand for such resources.

Furthermore, international students at the start of their education, find it extremely difficult to utilise the electronic resources available within universities' libraries due to lack of training and assistance. An extra effort and resources needs to be allocated specifically for international students.

Essays and assignments

There is clear evidence that international students lack the necessary understanding and skills in understanding, organising, writing and structuring of an essay or an assignment that clearly illustrates their discussions and supporting evidence.

The lecturer role at this stage is very crucial, as it is the stepping stone to set the norms for these students. Clear and simple verbal explanation of what is expected in the task, simplification of the wording of the written assignments, breaking it into steps and the provision of a marking guide clearly outlining the required pieces of information to be included. Furthermore a one-to-one approach is highly recommended to ensure that they are fully aware of what they are required to do.

There is an immense need to provide such students with similar problems with the necessary assistance and support through extra tutorials by lecturers/tutors and the provision of consultation time to go over assignment drafts.

Linking Theory to Practice

This is a very important link that needs to exist between theory and its application. The majority of the international students don't have working experiences that enable them to link the theory and concepts to previous work experience.

This makes it extremely difficult for them to fully conceptualise the material delivered in classrooms. Extra effort should be exerted by lecturers/tutors at the beginning to simplify the concepts and link it to student's personal experiences. Then gradually move towards applying the concepts to simple cases whereby students can draw back on the first application and establish the links between the concepts and the working environment.

Another approach could be providing samples and case studies that assist the students to comprehend how theory can be applied to situations.

Quality not Quantity - Information Overload

This is a statement I always hear from students whether they are international or local. However, if we add this factor to all the problems confronting international students, it becomes really detrimental to their learning.

Volume of information by itself is a daunting problem due to insufficient amount of time to read and digest the information, assimilate it into knowledge and the pressure to perform at the same time. The cognitive ability of the human brain to absorb and retrieve information has its natural limitations and rather than information acting as an empowering tool, it becomes an over-powerment tool. Particularly if the information is new, irrelevant and has no background experience to relate to.

Students whether they are local or international tend to be overwhelmed by irrelevance, preferring quantity to quality, insatiably pursuing information rather than the satisfaction of turning it into knowledge or wisdom.

Participation in Groups

The advantages of this method of learning are numerous and it is adopted by many universities as a vehicle of cultural integration, built up peer confidence, exchange of ideas and learning from others. It further fosters teamwork in future employment opportunities. In reality, that doesn't happen because the international students feel uncomfortable working with local students because of cultural differences, lack of self-confidence and language barriers. Local students on the other hand, prefer to work together because of cultural and educational similarities and the preconception that international students don't perform well and lack commitment.

However, when both local and international students perform as a group, it is noticeable that international students are less assertive than Australian students in putting forward their ideas, concerns and willingness to play an active role within their group. The international students tend to be passive, concentrate on social acceptance and harmony more than focusing on the task and expect other group members to delegate particular tasks to them. This is interpreted by the local students as lack of co-operation, commitment and unwillingness to accept their share of responsibility.

This vicious circle occurs in the majority of group work, which impose a serious impediment to the expected learning outcomes for international students. There should be a great effort invested in this area to make the process of group work a worthwhile experience for both international and local students.

Student growth, increased revenue, now what? NLC (2004)

- (h) Issue affecting the future of international education in Australia
- (i) Focus: increase students number and revenue. however, problems are identified relating to the international education industry. These include subjecting students to MRT (Migration Review Tribunal).
- (j) Most of the issues (i.e. immigration) are within the DIMIA.
- (k) Benchmarking on different initiatives taken by institutions.

Student services:

- (l) No measurements of services provided by education institutions to international students (e.g. student staff ratios, resources)
- (m) Professional development program: competencies of staff members in handling international students.
- (n) Compulsory training for sessional and casual staff?? but problems with permanent staff. academic qualification is a priority over whether an academic can deliver teaching effectively.
- (o) The same problem is applicable to administrative staff.
- (p) Inaccurate information on immigration matters (e.g. visa status, success/failure, unsatisfactory progress)
- (q) Factual information becoming a threat? especially to international students? Method of delivery might impact on student's reception.
- (r) University's role is to help students especially over immigration matters?
- (s) Plagiarism: is it a 'punishment' for international students? many international students are not aware of the concept of plagiarism, (not part of the culture).
- (t) Plagiarism as a course prior to tertiary education? However, supply and demand of the subject?
- (u) English as Second Language: problems with IELTS? Who is responsible in ensuring that international students are proficient in English. Lower IELTS intake means increased support?

Academic support

- (v) English for academic purposes.
- (w) The role of policy in University: acts as a platform for students to 'scrutinise' procedures taken by the university?
- (x) Academics are required to take 'random' samples of students' works 'moderation'
- (y) Plagiarism vs collaboration?

- (z) The root of the problem: Australian universities have to provide (for) 'more' with 'less'.
- (aa) Commercial concerns vs Educational quality
- (bb) Differing perceptions on philosophies between domestic and international students in paying and/or qualifying to be in university.
- (cc) Marketing vs Student Support Services Additional fees from int'l students used for promotion and not services (issue: salary differences)
- (dd) Problems with the myths on international students (aka. 'i wish i had a porsche') International Education Week (profiling of international students and related issues)
- (ee) NLC's potential : More resources required from external groups/institutions (hopefully) resulting in a greater level of professionalism and in its profile.
- (ff) Local Interaction: Lack of integration between international and local students on campus. Problems with purely international campuses and the chances/support they receive in interacting with local students : More personalization in the servicing of int'l students.

Supporting the 'genuine student'

- (gg) Student visa program: integrity vs outcomes

Focus: ESOS reporting process and what are the legislative requirements

- (hh) Reporting processes will be presented through workshops in the near future.
- (ii) Student requested companion disallowed due to privacy reasons.
- (jj) International offices and students should be made more aware of the proper processes (difficulty lies in each institution's own set of procedures in dealing with exclusions, etc.).
- (kk) An extension on the period pending for appeals needs to be increased from its current 28 days.
- (ll) Visa expiry prior to certification.
- (mm) Limited consultations between DIMIA and other peak bodies aside from 'industry' (AIEPB, AVCC, etc.).
- (nn) More accountable forums need to be set up at institutional, state and national levels.
- (oo) The lack of uniformity in procedure between the vast majority of institutions is one of the major causes of the current problem.
- (pp) Underlying 'corporate' mentality with the running and perception of universities today.
- (qq) Is the government providing more regulation and less support?

- (rr) The government has to see that tertiary education is not a source of short-term profit but rather a long-term investment.
- (ss) It has to be realised that while federal support is being reduced, it must be realised that new policies incur costs and difficulties in their enactment --> thus resulting in poorer services to students.
- (tt) Purpose of ESOS act is to protect Australia's tertiary reputation and students. Reform of the Act has been done in order to increase its effectiveness.
- (uu) Should the licensing laws be looked at instead?
- (vv) One of the worst aspects of the policy is the creation of 'compliance officers'.
- (ww) NLC is pleased with the current Education Policy presented, but it is everything surrounding it that is causing concern.
- (xx) NLC is concerned that the AIEPB is referred to solely by the government in the creation or advising of future policies and regarded as representative of all aspects of the industry.
- (yy) Perennial unresolved issue is that of the engagement/interaction of international students with local communities.

Students at risk

Focus: A lot of student visas are being cancelled in the name of unsatisfactory progress. Concern that it is the responsibility of the individual to meet up with service arms. Unsure that at risk students will only be informed about these procedures and problems until at the end of the semester. How or where do the students get these services?

Students have selective attention. Despite being told at every opportunity by the international office it is consistently ignored or misunderstood. Students need to take responsibility more.

- (zz) This information should be made more attractive.
- (aaa) How do you identify a student at risk?
- (bbb) Identification of the area of risk : and presentation of their options, etc, depending on the case.
- (ccc) Cross faculty students are the biggest grey area.
- (ddd) Language problems are a common cause.
- (eee) 'Potentially every international student is at risk from day one.'
- (fff) Students are not acutely aware of the need to renew their OSHC and visa (due to prior hand holding?).
- (ggg) These issues are not an absolute priority in a student's mind most of the time.

- (hhh) What is the magnitude of student problems concerning visa regulations? NLC: The numbers are growing year by year --> worrying that course coordinators, for eg, are unaware that they may have at risk students within their cohort, while DIMIA tends to go very strictly by the book.
- (iii) Those not involved in the international education sector are completely in the dark about ESOS regulations.
- (jjj) Visa length health cover or not? Would solve most problems in one go. But what about if any at risk scenarios occur? How long is the refund period?
- (kkk) Students working while they are studying. At risk students are those who are overworking. Is becoming the norm among students.
- (lll) Typically there are multiple reasons combined that results in a student at risk.
- (mmm) Proposed solution may be to deal with this problem on as small a scale as possible at the department level. But, not all universities can be structured in this way, nor the funding.

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Anderson, N and Richards, C. James Cook University, Australia. The unfulfilled promise of ICT in education: teacher education, new learning, and 'classrooms' of the future in the Asia-Pacific region

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Abstract

Increasingly, ICT (Information Communication Technology) has taken on an importance in formal education that is recognized around the world by governments in policies emerging from new learning theories and the requirements and possibilities afforded by a global economy and knowledge society (Papert & Cavallo, 2001). However, many wealthy or developed countries find that neither policy innovations nor large financial investments in ICT infrastructure for schooling are sufficient in themselves for effective integration of ICT in education. This paper will enquire into the paradox of how many of the unfulfilled promises of ICT in education represents a dilemma for formal education generally, and teacher education more specifically. Conversely, there are some useful projects in developing countries which remind us that necessity can be the mother of invention in more informal contexts of learning where people attempt to do a lot with very few ICT resources (e.g. the Ganokendra Centres in Bangladesh and the Jai Village project in Laos) – especially where educational purposes are seen as connected with wider community contexts and development.

Introduction

This paper will argue against the assumption that integrating ICTs into classrooms will improve educational outcomes for students in schools simply by being there or even by being used extensively by young people during the course of their education. Since the widespread introduction of computers in classrooms from the 1990s there has been evidence that excellent results can be achieved by using technology in certain ways, nevertheless, positive results have been the exception rather than the norm. It is our argument that exciting and innovative ideas concerning educational use of ICTs such as enhanced problem based learning, connectedness to community based uses of ICT and different ways of thinking – including opportunities to develop metacognition in new and powerful ways have largely been ignored by the system. In Seymour Papert's (2004) recent keynote, he argued that the system has rejected using ICT in powerful and innovative ways in favour of using it in mundane and disconnected ways that perpetuate the existing flawed system.

To support our argument that ICT has not produced its potential outcomes, we will cite some recent conclusions from educational researchers in Australia, Britain, the United States and Asia. In Australia: "The Victorian Education Department has poured millions of dollars into ICT, however the outcomes are less than impressive. Many teachers still have minimum ICT skills; students are frustrated with the lack of teacher knowledge, poor network designs, aging equipment and lack of leadership" (Australian Computers In Education Conference, 2004). A recent British survey found that although competency in using computers and associated technologies had improved, there had been little transfer or application of

this learning to other subjects. They also noted massive differences between the best and worst ICT implementations. Disappointment was expressed at the small number of examples found where the computer was used to extend students' creativity. As far as 'special education' was concerned, it was reported that the use of ICT was insufficient to have had much of an effect on student achievement (OFSTED, 2004).

The National Center for Educational Statistics in the United States reported that traditional 'drill and practice' activities dominated classroom use of ICT but pointed out that more powerful uses such as using computers for problem solving, programming or processing data were observed, "however many of these newer uses have been limited to a small proportion of teachers and students" (2000, p.3). Similarly, a recent report from Asia laments the lack of pedagogical change when they point out that "very often ICT is merely attached to existing classroom teaching and learning activities, leaving the traditional curriculum, learning objectives, teaching strategies and student activities more or less intact. While the learning medium may have changed, from textbooks to web-based books ... the learning paradigm remains the same" (UNESCO, 2004 p.75).

It is not possible to discuss all the complexities of the problem in the scope of this paper, so in order to further the discussion, we will present a particular case in relation to Hong Kong and then examine another case illustrating the concept of 'grass roots' community uses of ICTs in two developing countries and then conclude by briefly examining the concept of 'Knowledge-building Schools' as one possible direction for more powerful uses of ICT in education.

Hong Kong case study: the 'missing links' behind unfulfilled promises

As indicated in the previous section, ambitious policies for integrating ICTs in teacher education around the world have generally not translated into effective practice – especially in terms of how such policies often cite the learner-centred implications and educational reform (e.g. new pedagogical) possibilities of ICTs. This has perhaps reflected the tendency of various 'missing links' between top-down theories and approaches on one hand and local contexts of applied practice on the other at various levels of formal learning. However, schools and school teachers (and therefore teacher education institutions) have shouldered the central onus of expectation to harness the educational possibilities of ICTs for teaching and learning in the larger contexts of economic and cultural imperatives of globalizations. The associated dilemmas of ICT integration in education are especially acute in countries which have ambitious educational policies about this, have invested heavily in ICT infrastructure and resources, and where the larger society is relatively 'wired' or makes extensive extra-curricular use of ICTs. It is for this reason that Hong Kong, for instance, makes an exemplary case study.

Our interest here in exploring such a case study is not a negative one, but represents a desire to recognize and respond to the challenge of more effectively harnessing the promise of ICTs in education. It is clear that top-down policies, theories, and management or leadership need to be grounded more effectively in local contexts of applied practice. Our further discussion below of ICT community learning centres and related authentic, community-centred, and applied approaches for linking formal and informal modes of ICT integration in teaching and learning is offered as context for exploring better ways of harnessing the implications and possibilities of ICTs in education. This can be better appreciated in terms of a closer examination of some of the dilemmas faced in a key Hong Kong context of teacher education (the Hong Kong Institute of Education) where one of us (Richards) worked for several years.

Following on from the example of Singapore ICT 'masterplans' for education, Hong Kong educational policies strongly encourage the integration of ICTs in teaching and learning in terms of a range of associated 'new learning' initiatives such as life-long learning, learner-centred pedagogy and associated constructivist approaches such as problem-based learning, project-based learning and collaborative

learning (Education and Manpower Bureau, 1998; Education Commission, 2002). Such imperatives reflect the Hong Kong government's awareness that effective ICT integration is tied up with the educational reforms needed to ensure Hong Kong becomes a knowledge society and not only engages with but survives economic globalisation.

Yet, surveys of local teachers reinforce a notion that many find these new imperatives bewildering, the job of teaching increasingly stressful, and that there is never enough time to adequately prepare for new requirements. The unique pace of life and change in Hong Kong fuels the associated threats perceived by many often older teachers. These include general fears about change and the use of new technologies, specific concerns that younger learners have greater ICT skills and are less responsive to traditional teaching approaches, and increasing workloads at a time of increased job vulnerability to do as much with the state of the economy as with changing school conditions. This was recently exemplified by a joint 'protest' about the top-down imperatives of such policymaking by many of the school principals attending a local conference focusing on leadership for educational reform in Hong Kong schools (Walker, 2004). In other words, Hong Kong teachers are caught up in larger policy imperatives which encourage ICT integration in the context of a range of associated new and changing educational models

A recent study undertaken by one of us (Richards, 2004) adapted for educational research purposes a SWOT (Strengths, Weaknesses, Opportunities, Threats) approach to surveying and identifying some of the key tensions, dilemmas and general issues experienced by pre-service teacher education students when it came to their perceptions of ICT integration in Hong Kong education. In terms of the preconceptions and perceptions held by participants in relation to actual contexts of practice, SWOT is useful as a means or not only to further explore tensions and dilemmas which underpin action research and professional 'reflective practice' approaches to engaging with the challenges of ICT integration – especially in light of the strong ambivalences and frustrations experienced by many teachers. From a researcher perspective it is also a useful method for comparative (including cross-cultural) purposes as well as achieving more balanced yet also more insightful interpretation.

The key missing link evident in the study relates to the strong awareness of the participants that new, different and even exciting or innovative possibilities associated with the various learner-centred implications of ICTs are contradicted in practice by old teaching methods, a mere skills or theory approach to ICT integration and, above all else, an exam-based curriculum. This is reflected in the conflicting and ambivalent perceptions revealed in surveyed responses. Whilst there was awareness that aspects of design, application and innovation were important, perceptions of both personal and systemic strengths and weaknesses tended to revolve around the mere acquisition of technical skills (or failure to do achieve this). Likewise the perception of opportunities and threats focused on the missing links implied by related naïve notions that mere access and hardware provision were sufficient for ICT integration on one hand, and that the acquisition of ICT skills was not only important for, but could be assumed to automatically transfer into 'jobs' (and related pragmatic outcomes such as a good salary). In short, there was a core awareness of the problems and opportunities at stake but this was overruled by an entrenched sense of cynicism and inevitability which in turn reinforced the related syndromes of 'passive learners' and an idealizing of potential ICT 'magic bullets' (the belief that some new technology or method will come along which will transform the situation without any real effort or cultural change).

The SWOT survey also identified the related tensions and contradictions of three central issues of teaching and learning brought to a head by the challenge of ICT integration: the process of learning, assessment, and the failure to link school and extra-curricular uses of ICT. There was some awareness of how ICTs reinforce the increasing importance of the process of learning grounded in applied contexts of ICT usage as distinct from the mere transmission and reproduction of 'content' (information and/or skills) which informed a still dominant exam-based (or mere reproduction focused) curriculum. Likewise, some initial

interest in considering and investigating the kind of new assessment methods and approaches needed to more effectively harness the learner-centred implications of ICTs were ultimately discarded at the end of the day. Thus there was a dominant perception that ICT learning and use in schools and formal education was generally unrelated to the exciting extra-curricular home and personal uses on one hand, and the innovative requirements of ICT as focus for a global and future knowledge society on the other.

Underlying the often conflicting and ambivalent responses therefore was a strong sense that the challenge of ICT integration in teaching and learning can alternately be perceived as both an opportunity and threat in the Hong Kong context. Hong Kong's ambitious policy initiatives – and how they impact on teachers – are both strength and a weakness. This is partly due to an underlying cultural clash of different learning models, expectations and aims which is heightened around the challenge of ICT integration. Many of the new learning theories and approaches emphasise the learner-centred implications and possibilities of ICT tools and media for innovative, applied and generally active learning (in terms of collaboration, inquiries, projects, problem-based learning, etc.) – although this is not often effectively linked to practice. On the other hand, ICTs can also be used to reinforce 'old' rote-based or teacher-centred models of learning in terms of ICTs – e-learning platforms, CD-ROM and internet resources – used mainly as repositories for information or to provide 'drill and practice' sequences. To put this in clearer terms, Hong Kong education has more quickly and strongly than elsewhere embraced the rhetoric and policy of new models of learning and an associated imperative for ICT integration – but still tends to retain old assumptions in practice such as an exam-based curriculum and rote-learning methods.

What is needed is greater recognition that technological infrastructure and visionary policies are not enough in themselves to encourage effective ICT integration in teaching and learning. Effective practice and innovation requires some appropriate kinds of 'cultural' change, and can only come from greater recognition of the predicaments of the average teacher and how new imperatives are often undermined by 'old' assumptions, habits and expectations. Teachers attempting to employ innovative, applied or more actively learner-centred approaches often face the dual obstacles of learner expectation and administrative restraints informed by old learning assumptions. Put another way, learners often find the very old learning models (which are typically boring and assume, as self-fulfilling prophecy) reassuring, especially when it involves some sort of 'spoon-feeding' of the right answers or procedures. On the other hand, administrative regimes often reinforce notions of learning and assessment which reflect similar assumptions, and there may be a tendency in practice if not in policy to discourage innovative new practices.

But such approaches are clearly needed where ICT integration is concerned. Basic ICT skills tend to represent mere competencies and – like mere theories, policies and information - are not sufficient in themselves to translate into innovative applied or effective practice. Contexts of performance need to be provided to encourage this transferability of knowledge into practice as well as to evaluate the quality of design or application. This conversely requires educators to become more designers of effective learning with ICTs in order to go beyond old notions that teachers are basically transmitters of learning. On the other hand, this requirement to get learners to link their 'doing' and 'thinking' (or practice and reflection) can involve stages of frustration as they are challenged to be more active learners and to develop ICT literacy.

The ultimate paradox lies in how learners tend to be ambivalent about the clash of old and new learning models just as they are about the roles and functions of ICTs. Most know and often complain about the limitations and even counter-productive assumptions and tendencies of rote learning and exam-based approaches to learning and assessment. Yet they will also complain even more loudly (and be provided with plenty of opportunity to do so) about moves to introduce new approaches, especially those which challenge them to be more active learners. In short, teachers trying to proactively integrate ICTs in

education often find themselves in a more difficult situation than other teachers because of the inherently challenging and often frustrating aspects of the required hands-on approaches to ICTs in learning and associated new models of knowledge.

As epitomised by the Hong Kong context of pre-service teacher education, the overriding missing link at work is thus a clash between top-down imperatives and bottom-up requirement and possibilities for ICT integration in teaching and learning. The kind of gap evidenced between theory/policy and applied contexts of practice reflects an endemic resistance to connecting, recognising and promoting the ‘processes’ of learning and using ICTs in or as applied knowledge linked to various notions of ‘content’. At the learner level, a related gap between thinking and doing – needing to be reconciled to achieve applied or innovative reflective practice – is similarly reinforced by a related failure to link interesting and authentic extracurricular practices and knowledge to the learning and use of ICTs in classrooms and across the curriculum.

Community Based Models

In contrast to school systems struggling to fit new technologies into old pedagogical approaches and systems are emerging clusters of community based models born from necessity. Rather than struggling to use ICT in ways that are problem based and connected to the world outside the classroom – these approaches develop from pressing community needs and a desire to mesh new technologies with traditional life in value added ways. Some emerging community hub approaches have been adopted by the Jhai Project in Laos, the Island Watch Digital Networks in the Torres Strait Islands, the Ganokendra Centres in Bangladesh, the Yellow Sheep River Project in China and the LINCOS Project in Costa Rica – to name a few. In this paper we’ll briefly examine the Jhai Project and the LINCOS project and identify some relevant bottom-up trends that we have identified within these models.

The Laotian Jhai Project

The Jhai Foundation in Laos has established two distinct projects centred around ICT for education and community development. One model has followed a more traditional format of establishing ‘learning centres’ at the Phon Mi High School and in Vientiane, Savannakhet and Paksi. In the other model, pedal powered computers have been developed for remote communities where there is no access to mains electricity. These computers are also equipped with wireless technology and linked to the Internet through transmitter stations. A feature common to both programs is the ‘bottom up’ development as local communities approached the foundation to establish ways that different types of Laotian communities could access new technologies in powerful ways that centred on community and economic development. Even in the traditional settings the computer laboratories are being used in ways that are not typical of regular school systems. They are been used to “collaborate with schools in similar latitudes and the U.S. to discover ways to experiment with local organic cash crops for local and international markets. (2004, Jhai website <http://www.jhai.org/technology.htm>). This contrasts markedly with the types of ICT uses typical of classrooms in developed countries such as drill and practice software, educational games or re-typing hand written work.

In the remote model the community and educational use is even more enmeshed as the technology has created opportunities for fundamental changes in ways of living and has improved living standards. Every step of this project has involved creative problem solving and community collaboration to alleviate problems that existed in regard to communication and commercialisation. These communities have no mains electricity, no phones and are semi-subsistence farmers and have little extra money to support luxuries such as generators. Developing a system that would address the problems identified by the local communities posed a major problem that could only be solved by creative thinking. In top down approaches the solutions are often techno-centric and not sustainable in these contexts, whereas the

approach taken in the Jhai Foundation initiative reflects the pursuit of appropriate, creative and intelligent solutions.

Part of this intelligent system was the construction of computer systems ideally suited to these environments. The resultant machine has no moving parts, is small and compact, and has a waterproof case designed to counter the onslaught of the South-East Asian monsoon season. The main processor is a 486-type chip, which allows the use of a heat sink rather than a fan, thereby eliminating the common problem of fans seizing up in adverse conditions. More powerful processors, like recent Pentiums and AMD chips, require large fans. The Apple G5 requires multiple fans as well as a liquid cooling system. These are all potential problem sources in harsh conditions. Importantly, whereas a standard desktop computer requires 90 watts of power, the project machine draws only 12 watts. The machine uses a small energy saving LCD screen, and flash memory chips have replaced a conventional hard disk drive. Finally, the machine has been designed to withstand formidable conditions of different kinds for a minimum of 10 years with little or no maintenance. These conditions include torrential rain, choking dust, and intense heat and humidity at different times of the year. In addition the machine is equipped with a standard wireless network card and linked via repeaters on the roof of the hut to antenna on the hills and mountains to the city. The machine will ultimately be capable of mass-production for less than \$400 U.S. dollars per unit.

In contrast to conventional and profoundly artificial uses of email and voice communication in regular schools, these systems are critical means (and the only means) of wider communication via email and phone (Voice over IP). Information gathering on the web has been part of another community based problem solving exercise that has involved gaining organic certification for crops, learning about more efficient ways of producing organic crops and gathering important strategic information about markets. Plotting when and where to target markets has the potential to improve the economy of the villages. In short, simply developing a sustainable, appropriate means of participating in the global society has been an extensive and collaborative project and uses of the ICTs are substantially linked to the everyday wellbeing of the community.

The LINCOS Project

The LINCOS model involves a transportable community hub with more expensive infrastructure and support requirements than the Laotian model outlined above. Sheats (2000, p.41) described the LINCOS model for the building infrastructure as follows:

[Physically], the fundamental basis of the LINCOS digital town centre is a standard ISO shipping container (2.4 x 2.4 x 6.1 m) remodelled and equipped with a set of IT and wireless communication equipment. It is Internet-linked via satellite, with standalone power source and measurement capabilities for medical and analytical applications.

This LINCOS project, based in Costa Rica, has been in operation longer than the Jhai Foundation initiative, and offers some features that could be taken up by the Jhai Project. For example, the LINCOS model uses low cost probes and testing equipment to measure important soil characteristics. These measurements are sent via the web to distant scientific laboratories that provide advice on deficiencies in the soil or requirements of particular crops. In the case of the organic production approach used by the Laotians, this would mean adding organic phosphorous, nitrogen, or whatever other nutrients were required to ensure higher crop productivity or quality. Another interesting application is the training of a health monitor who uses the Internet, software and basic instruments to provide health care and preventative advice. LINCOS, however, uses Microsoft Windows operating systems and software. It is a considerably more expensive option and possibly not suited to the types of locations potentially served by the Jhai model. Some of the same community uses could, however, be supported.

The LINCOS model has developed methods of using ICT for educational purposes. It has adopted principles outlined by Seymour Papert (2001) for applying constructivist learning principles in practice. Papert has had direct involvement in the project through LINCOS's partnership with MIT. In Papert's model students use the technology to solve genuine community problems, such as building bridges and roads, using word processors to record project proposals, spreadsheets to facilitate genuine budgets and various other ways of solving social problems. They also take control of the machines by engaging in basic programming, using Logo, and even engage in linking computers to other devices like simple robots. Using a model involving a pre-conceived and transportable building could be interpreted as an 'imposition' rather than as a response to a community need, although it has the advantage of being completely set up for its intended purpose. Importantly, the coordinators of the project negotiate with the community on how the facility in used is various locations, thereby increasing the idea of 'community ownership' of the hub.

Conclusion

As indicated above, many contexts of formal education epitomize the dilemma and related missing links of how the challenge of ICT integration exacerbates implicit clashes between old and new models of teaching and learning. This is especially the case in contexts where primarily top-down approaches are in operation in conflict with or at odds with bottom-up possibilities and requirements. Conversely, the Asia-Pacific region is also currently generating some interesting and powerful models of ICT community learning centres, especially in rural or developing areas (Anderson, 2004; Richards, 2004). In these models ICT is being used as an innovative and essential tool in building better educational and economic opportunities for communities. Bigum (2000, n.p.) critiqued the view that ICT was some sort of 'magic bullet' for improving student outcomes in mature school systems when he advised that "instead of assuming that IT will, in and of itself, provide good educational outcomes and improvements in schools, or trying to make IT fit the existing mould of educational practices which make up the school, IT needs to be seen as a still relatively poorly understood new medium, requiring careful and critical experimentation". Since then Bigum (2004) has been experimenting with the concept of 'knowledge building schools' where students use ICT as part of problem based activities that the students and the community value. These activities involve the production of data and the generation of new knowledge in much the same way that is naturally occurring within some community hubs in developing countries and may be a compelling models for schools to explore.

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ABSTRACT

For the 21st century we need to train young people to possess various skills such as computer use, media technology and critical thinking. Such skills are important for flexible and life-long learning. In particular, critical thinking skills are important generic skills that should be fostered at university. Media technologies and Computer Assisted Instruction (CAI) are well placed to nurture and develop these skills.

The objective of this study is to develop alternative teaching strategies to teach critical thinking skills to university undergraduates. The alternative teaching strategies used in this study were CAI and Co-operative group learning. CAI allows students to have more control over their own learning, to think analytically as well as critically and to construct their own learning through technology. Co-operative group learning is a structured, systematic teaching strategy in which a small group of students work together toward a common goal.

This study was carried out using CAI and Co-operative learning to teach critical thinking skills in Mathematics with university undergraduates of Rajabhat Institute Suan Sunandha (RISS). One hundred and twenty volunteers were randomly selected from RISS undergraduates enrolled in Mathematics with 38 students placed in a Traditional teaching group, 40 students in CAI and 42 students in Co-operative learning. Pre-tests, Post-tests and a General Skills Test based on Watson-Glaser's Critical Thinking Test were used to determine the differences between the methods of teaching. This paper will discuss the results obtained and the differences observed between the Traditional, the CAI and the Co-operative Learning groups. This investigation will shed light on the effectiveness of new alternative strategies for teaching Critical Thinking in Mathematics courses.

Keywords

Teaching strategies, Critical thinking, Co-operative learning, CAI, Online Learning, Flexible learning

Introduction

In recent years there have been rapid social changes and globalization in the fields of economy, mass transportation, information technology (IT) and lifestyle. To adapt ourselves to this fast changing environment, we need to prepare students to possess basic skills, good working habits, computer skills and media technology, critical thinking, reasoning, problem-solving skills, conflict resolution and negotiation skills that enhance the capability of lifelong, co-operative and flexible learning.

Education builds the nations, empowers the individual and generates employment. The Thai government realized that the people are the center of development so all Thai people should be encouraged to participate in higher education. The government launched the Essential Features of the National Education Act of B.E. 2542 (1999). The key aspects of this reform focused on improving the learning process through the learner-centered approach, self-education and lifelong education by emphasizing the power of creatively, encouraging a love for reading, providing sufficient community-based libraries, learning centers and educational mediums for public use. Furthermore, they plan to install computers in all high schools and use computers in the Thai higher education system.

Critical thinking has become a major focus of conferences, publications, and programs in higher education. Most universities aspire to educate graduates who think critically and can make judgements in complex situations on the basis of sound reason, adequate evidence, and articulated values. Mathematics is one way to generate thinking and reasoning skills among students. An understanding of math concepts, computation and problem solving is essential to a truly literate person. In Thailand, all undergraduate university students have to complete a minimum number of math classes in order to graduate. For students, adapting their study skills to the specific demands of a math class can be frustrating.

Rajabhat Institutes (RIs) are the educational institutes for local development with the objectives of providing academic and high level vocational education. All 41 RIs require all students to learn Mathematics (Thinking and Decision Making course). The objective of this course is teaching for thinking, teaching of thinking, and teaching about thinking. As a result of using an Attitude towards Mathematics test, 80 freshmen of Rajabhat Institute Suan Sunandha (RISS) enrolled in year 2001, reported that they felt Mathematics is complicated, complex, unenjoyable, boring and irrelevant. Thus, the new teaching methods such as Online Learning (previously called Computer Assisted Instruction (CAI)) and Co-operative learning could be the alternative strategies for teaching to enhance the cognition of students and improve their attitudes.

Educators use computer and related information technologies as educational tools. Online Learning is an opportunity for a global education provider with an expansion in the number of students, limited budget, facilities constraints and the lack of experienced instructors. On the other hand Co-operative learning is a structured, systematic instructional strategy in which small group of students work together towards a goal.

The purpose of this paper is to compare the effectiveness of the teaching methods: traditional based, CAI based and Co-operative learning based in a Mathematics course. The framework of developing critical thinking will be measured by adapting Watson-Glaser Critical thinking Appraisal (WGCTA, Form S).

Literature review

Critical thinking is the central concept underpinning some key features of this research. The concept has been defined in various ways. Dewey (1909) called critical thinking 'reflective thinking' and defined it as: active, persistent, and careful consideration of a belief or knowledge and the further conclusions to which it tends. Ennis (1987) defined critical thinking as reasonable reflective thinking that is focused on deciding

what to believe or do. Reflective activity means not to solve a problem, but to better understand the nature of the problem. The focus on deciding means thinking about something that we wish to understand more thoroughly. The purpose of critical thinking is to weigh and evaluate information in a way that ultimately enables us to make informed decisions. Unlike problem solving, the content of critical thinking is often a belief or a motive to examine more thoroughly. Critical thinking can be viewed usefully as a combination of abilities and dispositions. Ennis has refined his lists of critical thinking dispositions and abilities in response to critique from others. The 1987 version of dispositions and abilities comprises 14 dispositions and 12 abilities. (Ennis 1987)

Some researchers have used the term critical thinking as a synonym for higher-order thinking. Others have defined critical thinking as “directed thinking” that is purposeful, reasoned and goal directed (Halpern 1997) or as a rational response to questions that cannot be answered definitively and for which all the relevant information may not be available (Kurfiss 1988). Bell (1999) regarded that critical thinking was deciding what to believe and how to use information after a careful evaluation of the evidence and reasoning. Critical thinking is viewed as a process with three essential components: knowledge of a topic, a set of skills that can be used to evaluate both information and reasoning, and the attitudes to apply the knowledge and skills in deciding what to believe. The present research employs Ennis’s critical thinking dispositions and abilities in the design of the problems as well as in the planning and implementation of the group learning process.

Critical thinking is the use of those cognitive skills or strategies that increase the probabilities of a desirable outcome. It is used to describe thinking that is purposeful, reasoned and goal directed and the kind of thinking involved in solving problems, formulating inferences, calculating and making decisions when the thinkers are using skills that are effective for the particular context and type of thinking task. Critical thinking also involved evaluating the thinking process, the reasoning that went into the conclusion we arrived at and the kinds of factors considered in making a decision. It is a skill that may be improved in everyone and so it should be taught to all ages.

Critical thinking can be taught by the combination of the process approach and the context approach (ERIC 1988). Teachers must have an extensive knowledge of their own abilities and how they differ from others and then instruct students to apply cognitive skills in their areas and make contextual links with other areas. An example of teaching critical thinking in Thailand is the teaching of the Thinking and Decision Making course for freshmen in all 41 RIs. The steps of teaching are using a story approach (for instance, day to day event or news) and then encouraging students to discuss and analyze arguments as well as opinions and trying to justify, refute, and evaluate them. Students should reflect on their beliefs and try to validate them with evidence.

Mathematics is a subject that should enhance thinking and reasoning skills among students. In learning Mathematics, students are taught to use a logical process which is the central element in efforts aimed at improving thinking, especially critical thought so Mathematics is the basis of new technology knowledge. For example, mathematical algorithms and mathematical logic are the basis of computer software and hardware.

The technology afforded a significant educational advantage. Calculators allowed users to analyze mathematical information by manipulating essential aspects of mathematical inquiry such as formulas, graphs and tables that were cumbersome with traditional tools of pencil and paper or chalk and blackboard (Gordon 2000). The computer technology was used for transforming the teaching method and reaching more learners. Online learning is a new tool to extend educational access to improve the quality of face-to-face classrooms and change the nature of teaching-learning interaction by involving the learners directly in creating effective learning environments.

Computers are interactive with microcomputer systems incorporating various software packages that are extremely flexible and maximize learner control (Alexander 2001). Computer technology is rapidly advancing with constant innovations, and decreasing costs. Damoense (2003) indicated that technologies based pedagogy and an effective online learning environment are crucial to support and enrich effective learning outcomes (high order thinking, critical thinking, and problem-solving skills).

Mey (1982) found that there was a strong relationship between developments in computer technology and cognitive psychology. The computer could provide skills training such as CAI, drill-and-practice and simulation. CAI has been used for teaching for more than a quarter of a century. CAI can cut training time and can also be more cost-effective than additional tutoring, reducing class size or increasing instruction time to attain equivalent education gains. Simulation in CAI can provide learning experiences that are not possible with other media. Furthermore, CAI allows students to have more control over their own learning, to think analytically and critically, to work collaboratively and make the constructivist approach easier through technology.

According to Cooper et al (1994) cooperative learning is a structured, systematic instructional strategy in which a small group of students work together toward a common goal. These features include the need for students to be concerned about the performance of other group members as well as their own, and the need for all members to share responsibility for leadership actions in the groups (Johnson et al 1993). Hager et al. (2003) used the co-operative learning and flexible learning to improve student learning outcomes and enhance their generic skills. Formal cooperative learning groups were used to work on thinking tasks and informal cooperative groups were used for peer instruction in lectures.

There are many teaching methods to teach critical thinking skills such as traditional lectures, CAI and Co-operative Learning. Since the aim of this study is to examine the effectiveness of the three teaching methodologies, the appropriate critical thinking test should be designed to serve the need.

Critical thinking can be measured by using the Cornell critical thinking testing level X and level Z, the Watson-Glaser Critical Thinking Appraisal (WGCTA) and other tests. Cornell critical test level X is aimed at students in grades 4-14, level Z at advanced and gifted high school students, college students and other adults. The tests are regarded as general critical thinking tests because they attempt to cover critical thinking as a whole.

WGCTA is designed to measure important abilities involved in critical thinking and has been used to predict performance in a variety of educational settings. It also has been a popular selection tool for executive, managerial, supervisory, administrative, and technical occupations for many years. WGCTA is a critical thinking test which is widely used. It is composed of five subsets: Inference, Recognition of assumption, Deduction, Interpretation and Evaluation of arguments. In this research, the researcher adapted WGCTA to measure the abilities involved in critical thinking.

In This study, the modified form of WGCTA was used to measure critical thinking. The modification had been done by Hager, Sleet, Logan and Hooper (2003) and used in their study. The translated form was tried-out with Thai students. The analysis showed the reliability of 0.7728, with 24 selected items. Three tests according to the three lessons, Critical Thinking, Mathematical Thinking and Logic and Reasoning showed the reliability of 0.7921, 0.7801, 0.8025 respectively. The paralleled forms were simply rearranged some items and some alternatives. It was expected that the tests would be consistent over the test-retest situation.

Method

The population of the study was 1,000 freshmen undergraduates of RISS who enrolled in the Thinking and Decision-Making course. One hundred and twenty volunteer students were randomly selected including both genders, 17-20 yrs-of-age and students enrolled in this course for the first time. The students were from Statistics, Biology, Physics, Thai Studies, Library Studies and Finance courses. They were randomly assigned to three groups by using the GPA scores, and then reallocated to assure approximately equal gender representation in each group. There were 38 students in the Traditional Learning group, 40 students in the CAI group and 42 students in the Co-operative learning group. In the experimental groups, students were trained to think critically by CAI lessons and Co-operative lessons while the control group was trained with traditional lectures. The course consisted of 12 sessions which covered the Human Brain and Thinking Skills, Development of Thinking Process, Creative Thinking, Deep Thinking, Critical Thinking, Mathematical Thinking, Logic and Reasoning, Data Collection, Data Analysis, Decision Making, Linear Programming and Revision. Nine sessions were presented in the traditional lecture format to the whole class. The three sessions: Critical Thinking, Mathematical Thinking and Logic and Reasoning were used for the experiment. Even though pairwise assignment was used the randomized block design analysis was not performed due to the fact that learning took place in a group process. The independence between block was not maintained. It was expected that relationship between block and treatment would be null. The pairwise process was only to obtain equal ability among the three groups. It should be pointed out, as well as, that the study was conducted on a time series setting. It was expected that the carry-over effect would be shown in the last session, the Logic and Reasoning lesson.

Data were collected by two parallel forms of pre-test, post-test for General Skills Test (GST) (the modified WGCTA test) and for the Critical Thinking, Mathematical Thinking and Logic and Reasoning topics. These tests were administered immediately before the topic was introduced and the week after the topic was taught. The GST test was conducted at the start of the course and on completion of the three special topics. The quantitative approach was used to investigate the research question. Descriptive statistics were used to analyze student performance. Dependent t-tests were performed on pre-test and post-test. One-way analysis of variance with Scheffe post-hoc comparisons was employed to confirm any possible differences among methods of teaching.

Results

Comparing pre-test and post-test scores on General Skills Test, it was found that there were substantial gains in all three groups, with the Co-operative Learning having the highest gain of 1.45 and the Traditional Learning the lowest gain of 0.74. However, it should be pointed out that the amount of gains did not exceed the boundary of one standard deviation. A statistical test of the gained scores was performed and it was revealed that only the gain of the Co-operative Learning group was significant (*) and the other two groups were not. The averages of the pre-test and post-test among the three groups with the corresponding standard deviations were presented as follows:

	Pre-test	Post-test	T-test
Traditional	11.63±2.28	12.37±3.49	-1.054 (p=0.299)
Computer Assisted Instruction	11.97±3.20	13.13±2.69	-2.005 (p=0.052)
Co-operative group	12.07±2.64	13.52±2.46	-2.878 (p=0.006)

ANOVA (repeated measure) $F=0.366$ ($p=0.694$)

Considering the pre-tests and post-tests for the three topics used in the experiment, a similar pattern of gains was observed. It was found that the gain on Critical Thinking of the CAI group was statistically significant. Significant gains were also found on the Logic and Reasoning Thinking in all three groups. There were small decreases in Critical Thinking with the Co-operative Learning group and in Mathematical Thinking with the CAI group. All the rest reported gains in the post-tests. The averages and their corresponding standard deviations are presented below.

		Traditional Group	CAI	Co-operative Group
Critical Thinking	pre-test	6.18±1.61	5.60±1.66	6.40±1.47
	post-test	6.50±1.50	6.47±1.68	6.38±1.48
ANOVA (repeated measure) F=2.016 (p=0.138)				
Mathematical Thinking	pre-test	5.53±1.89	5.55±1.41	5.55±1.81
	post-test	5.55±1.41	5.35±1.76	5.86±1.92
ANOVA (repeated measure) F=0.599 (p=0.551)				
Logical & Reasoning Thinking	pre-test	5.63±1.81	5.57±1.80	5.93±1.60
	Post-test	6.84±1.50	6.40±1.26	6.69±1.66
ANOVA (repeated measure) F=0.563 (p=0.571)				

The methodology chosen worked well. Sufficient students with the right characteristics volunteered for the experiment and it was possible to allocate them to three groups of approximately 40, as had been intended. More significant results might have been obtained if there had been more basic training for the CAI and Co-operative groups and more than three teaching sessions used. However it had been considered a successful introductory study. Additional data were collected and their analyses would be reported in subsequent publications.

Conclusions

Even though some significant gains were reported, it was found that comparison among gains of the three approaches of learning did not show any significant values.

The lack of difference on gains among the three groups was contributed to the limited time of the study. It was observed that during the experiment the subjects in both CAI and Co-operative groups were not fluent in their proper conduct of the learning process. Their experience in the learning pattern did not reach the required level because this was the first time for many students to participate in these learning procedures.

This study was intended to be the beginning step of searching for new educational strategies. It would be beneficial to those looking for alternative strategies in teaching Critical Thinking in Mathematics.

For further investigation, longer period of study should be considered and basic training for the essential skills used in the alternative learning approaches should be incorporated for those who do not have prior experience.

The alternative strategies used in this study produced more gains than the traditional course but the different amount of gains between the different teaching methods were not quite statistically significant. An important feature of the research was that the alternative strategies did not result in a weaker performance.

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Audy J & K, Haines, T., and Killen P. Edith Cowan University, Australia. Students Responses To New Teaching And Learning Approaches Involved In Surf Science And Technology: Making Surf-Craft Fins And Examining Their Performance

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Abstract: The common characteristics for surfers are the passion for the surfboard and surfing. Generally, for surfers the most important device is a surfboard. A surfboard is equipped with fins that provide lateral stability to the craft. In seeking improved surfboard performance, researchers, manufacturers and users have made significant modifications to fin geometry and the use of advanced materials. Improvements in design, however, seem to be made mainly via empirical approaches because of lack of scientific evidence in open literature sources. Most recently, at Edith Cowan University (ECU) a unique method was developed that allows prototyping with minimal set-up costs. This process was taught as part of the Materials Science course in the Surf Science and Technology degree program. The results presented in the paper are various examples of fins made by students in laboratory conditions at the university. Some commercial fins were included for comparison.

1. INTRODUCTION

The majority of fins have a classic geometry similar to that shown in Figure 1. The distinctive features of fins are fin length (or depth), d , fin base length, b , and a number of fin thickness distributions from y_1 to y_n , see Figure 1 (a). There is also the shape (outline) of the fin that is symmetrical around a central curve, see Figure 1 (b). Consequently, the outline of the fin determines the fin area, while the curvature of the central curve determines the fin rake, see Figure 1 (c).

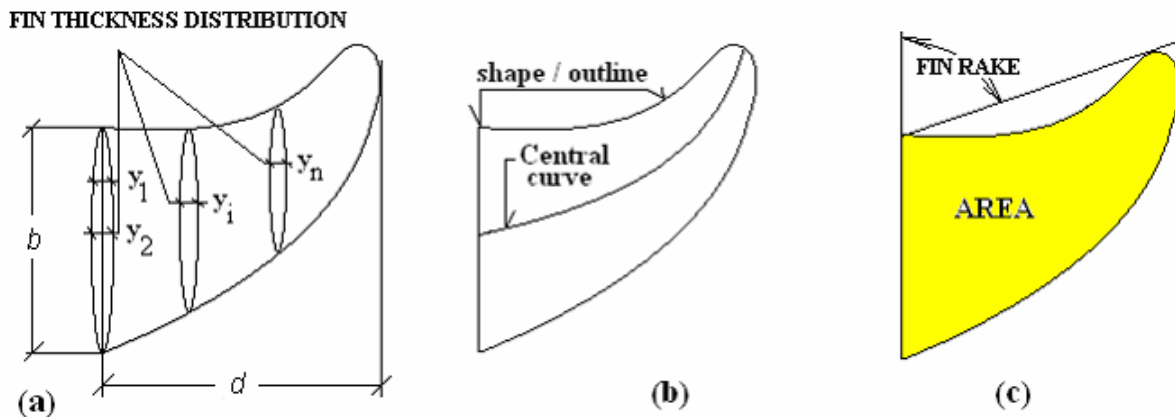


Figure 1 Basic dimensional features of a surfboard fin

The effects of basic dimensional features of a surfboard fin on various performance measures, adopted from sources [1 to 8], are briefly described as follows. The depth of fin, d , in the water affects the hold the fin has in turn *i.e.* the greater the hold the more efficient control of a surfboard. The fin base length and thickness distribution provide an adequate bonding area at the fin-surfboard interface *i.e.* the greater

the base length and the thickness the better the bonding strength. Moreover it is expected that the increases in the fin base length should improve the drive and speed of a surf-craft. Fin rake affects turns *i.e.* lower rake angles allow tighter turns and vice versa.

It is generally accepted that the position of the fins on the surfboard strongly influences manoeuvrability and hence influence the forces acting on a surfboard [1 to 8]. The location of central fins may be defined by the distance from the tail of the board. In addition to the distance from the tail, the positioning of side fins may be described as shown in Figure 2, left and right, respectively.

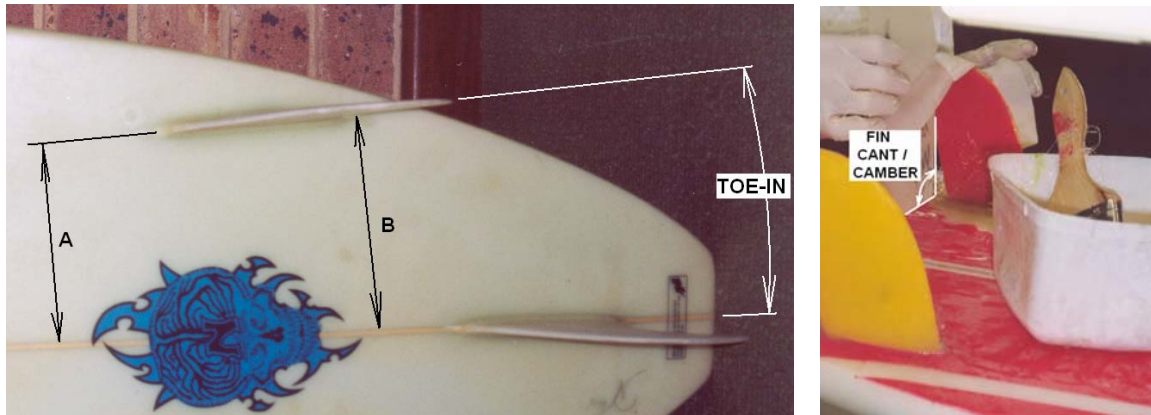


Figure 2 Fin Toe-in, left, and Fin Cant / Camber, right.

From Figure 2 left, it is evident that the toe-in (the angle towards the stringer) is determined by dimensional features of A and B. It should be noted that drag depends on section characteristics and angle of attack. For example, a thick fin at zero angle of attack may have a larger frontal area but a lower drag than a thinner fin at some finite angle of attack. Lowering the toe-in values, by increasing A and decreasing B, tends to align the fins with each other (and the central fin if one is present) and reduces drag when more than one fin is in the water. This is expected to increase the speed via reductions of drag forces. Alignment of the fins also reduces manoeuvrability. Higher toe-in values have the reverse effect. From Figure 2 right it is evident that fin cant / camber angles are usually higher than 90 degrees and are inclined away from the stringer. Literature sources [7 and 8] suggested that fins with excessive cant angles have a tendency to act like a hydrofoil and push the tail up.

To date, little information has been published on the effects of fin geometry on forces [1 to 8]. This information was mostly descriptive without providing any quantitative data for comparison between different fin geometries or allowing a study of effects of individual design features on forces as a whole. Consequently, the present investigation was set up to analyse the effects of fin design modifications on various performance measures of different fins produced at the ECU environment and to compare the result data with those obtained from commercially available fins.

2. EXPERIMENTAL DETAILS

The students at ECU studying Surf Science and Technology are encouraged to design and develop their own fins, before learning more advanced approaches for surfboard production. The main teaching and learning approach used is via interpretation of the industrial process into university courses with University undergraduate procedures [9]. The courses are structured in the way that the research obtained through the university may be used for the industry.

2.1 Design Approach Used for ECU Fins

The design approach used for ECU fins is one based on airfoil data for a variety of wing sections published in literature source [10], and fluid motion patterns published in literature source [11]. It was assumed that wing sections have strong similarities with the fin sections and therefore those quantitative ‘empirical’ data could probably be equally applicable to fin design. The methodology is shown as follows.

Students chose the depth (d) and base length (b) of the fins they intended to design and produce. From the fin base lengths it was possible to determine the Reynold’s number, R , using Equation 1, and corresponding variables shown in Table 1.

$$R = \frac{\rho.V.b}{\mu} \tag{1}$$

Table 1 Variables for Equation 1.

Symbol	ρ	μ	V
Meaning	Density of sea water	Dynamic viscosity of water	Flow velocity
Values	1025 kg/m ³	0.0010 kg/(m s)*	Use 20km/h or 5.56m/sec

*0.0010019kg/(ms) is the value for pure water at 20°C

The Reynold’s number was used to determine the expected conditions in the boundary layer flow around the surface of the fin. This flow could be laminar or turbulent, see data in the following Table 2.

Table 2 Reynold’s number and Type of flow pattern

If	$R < 1 \times 10^5$	$R < 1 \times 10^7$ and conditions are ideal	Otherwise $R > 1 \times 10^5$
Then	Laminar flow	Laminar flow	Turbulent flow

After this, each student chose a NACA airfoil section from literature [10] that provided the relevant data for calculating the fin thickness distribution in different fin sections. Particularly, three NACA standards were chosen, namely, 66₂-015, 0012, and 0012-64. The majority of students followed the NACA 66₂-015 standard. It was probably because this standard allowed for quite generous fin thickness allowances that were suitable for hand laminating techniques used at ECU.

Having selected the NACA standard, students also calculated the leading edge radius as a percentage of fin width. These values were 1.43% for the NACA 66₂-015 standard, and 1.58% for the NACA 0012 and 0012-64 standards. This allowed for the finishing of the shape of the fins from which the surface areas were determined.

From the fin surface area and the fin length it was possible to calculate the Aspect Ratio, A , as the span squared (depth of the fin, d , squared) divided by the surface area, S , see Equation 2.

$$A = \frac{d^2}{S} \quad (2)$$

The next step was to determine the drag and lift coefficients. It was done using empirical plots provided by NACA standards. An example is shown in Figure 3 for the NACA 66₂-015 standard. It was assumed that the actual attack angles for fins range from about 4 to 8 degrees. Consequently, for the angle of attack of 8 degrees and a Reynold's number $R = 3.0 \times 10^6$ the lift coefficient, $C_L = 0.77$, was determined. For the $C_L = 0.77$ corresponding drag coefficient, $C_D = 0.012$ was found.

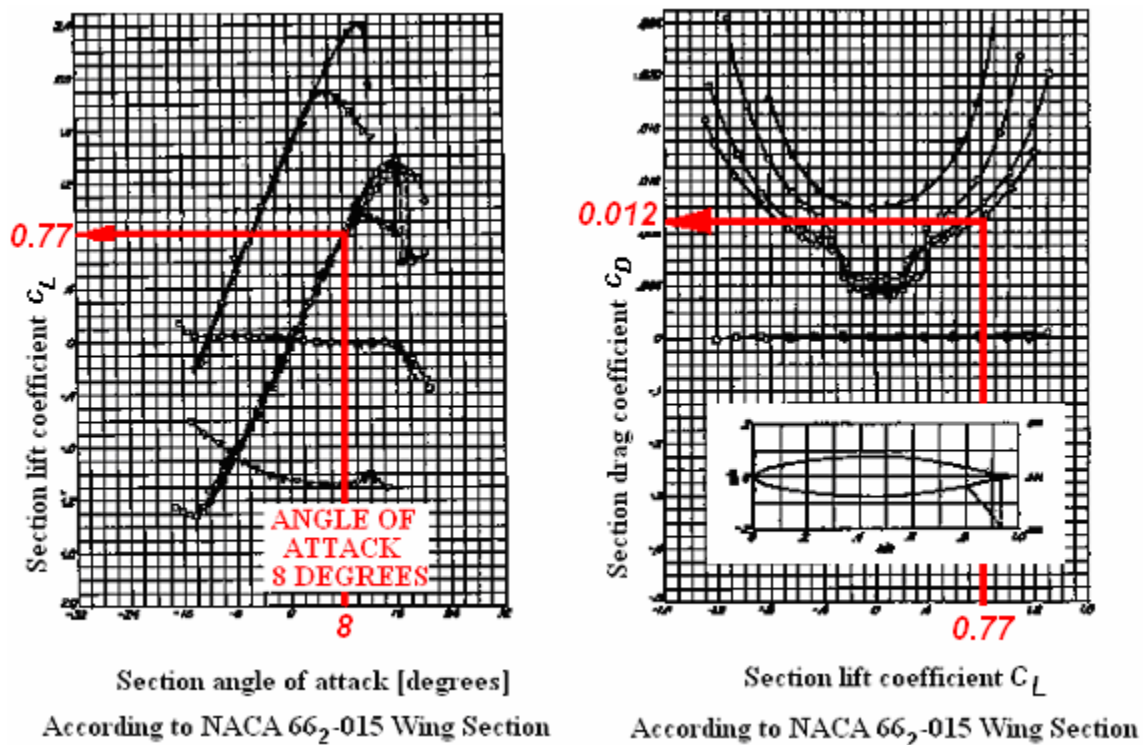


Figure 3 Plots of NACA 66₂-015 standard for determining lift and drag coefficients [10]

Having determined the lift and drag coefficients and knowing the quantities of ρ and V , see Table 1, and Fin Surface Area, S , it was possible to calculate the lift 'favourable' force(s) and the drag 'unwanted' force(s) acting on each fin, see Equations 3 and 4.

Lift force
$$L_F = 0.5 \rho V^2 S C_L \quad (3)$$

Drag force
$$D_F = 0.5 \rho V^2 S C_D \quad (4)$$

Once the calculations indicated that the fin designs would be acceptable for surfing the fins were made by a laminating technique. First a ‘male’ pattern was made for both halves of each fin. For each design, two halves - a “right” and “left” outline - were drawn on a piece of plywood with at least 50mm clearance all round to allow plenty of room for working. Outlines for fin box attachments were drawn at the bases (if required). Depending on the size and complexity of the fin, a number of chords (lines from the leading edge to the trailing edge, parallel to the base) were drawn. Along each chord, small nails were driven partway into the plywood so that they protruded by an amount equal to the appropriate section thickness. These provided hard reference points. The halves were then formed using a “bog” of lightly catalysed filler resin and “Q-cells” (about 35-40% by weight). After curing, the bog was sanded back to the nails, giving the two male moulds. The mould was covered in several coats of PVA mould release agent and it was then used for production of a ‘female’ mould containing both fin halves. This mould was then used for making fin halves from layers of E-glass matting and polyester resin. The halves were glued together using a mixture of resin and chopped glass fibres. The completed fin was lightly wet sanded with careful attention being paid to the curvature of the leading edge. The process is shown in Figure 4.

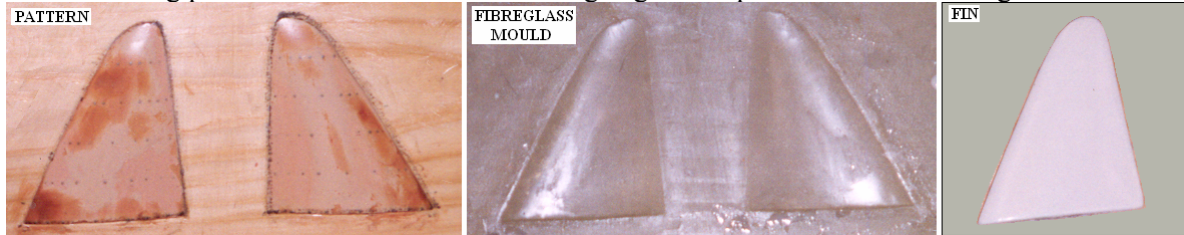


Figure 4 Photographs showing a male pattern, left, a female mould, middle, and a fin produced manually by laminating technique, right.

Figure 5 is a set of photographs showing various examples of student works involved in fin making activity. These photographs are presented in a sequence that shows individual stages in a production flow charge, starting with sharing knowledge (a) ... and finishing with fin product (y).



(a) Sharing knowledge



(b) Drawing fin shape



(c) Measuring fin width distribution



(d) Nailing fin shape



(e) Finishing a fin pattern



(f) Applying a bog



(g) Grinding fin shape



(h) Applying PVA release agent



(i) Drying the bog pattern



(j) Cutting E-Glass strips



(k) Filling the larger changes in surface height with fibreglass strips



(l) Laminating the pattern

Figure 5 Students engaged in Fin Making Activity during “*Surf Equipment, Design, Materials and Construction*” course in the 1st semester of 2004, Courtesy Audy.



(n) Drying Pattern and Holding it proudly



(o) Separating the patterns



(p) Inspecting the mould



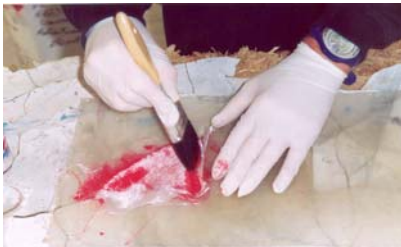
(r) Applying PVA release agent and Drying the mould



(s) Cutting Fibreglass fin shapes



(t) Weighing the resin



(u) Positioning the fin strips



(v) Laminating fin strips



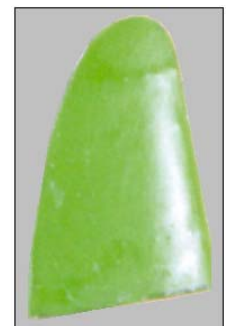
(w) Drying and Removing fins



(z) Cutting the offset



(x) Grinding and Gluing the fin halves



(y) Final Product

Figure 5 Continued from previous page

From above it is evident that the main aspects involved in teaching and learning activity at Surf Science and Technology are Experimentation and Design, Improvisation, and Individuality of Learning Environment. Experimentation and Design was conducted on development of real fins. Improvisation was necessary due to limited resources and lack of access to commercial professional testing equipment such water tanks and/or aerodynamic tunnels for testing fin prototypes. Students had to think laterally to make use of available NACA airfoil sections in literature [10] to select situation and conditions where

were both reliable and accurate. Individual Teaching and Learning Environment involved a number of fins designed and produced by individuals.

The experiments at Edith Cowan University indicated that a variety of high quality fins can be designed using equations and empirical data adopted from the literature source [10]. Some fins that were made in that way are shown in Figure 6.

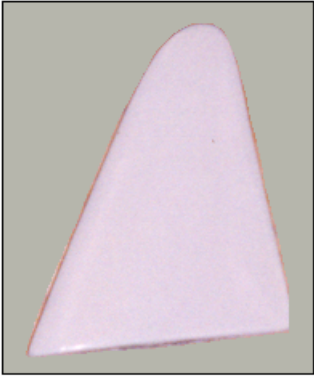


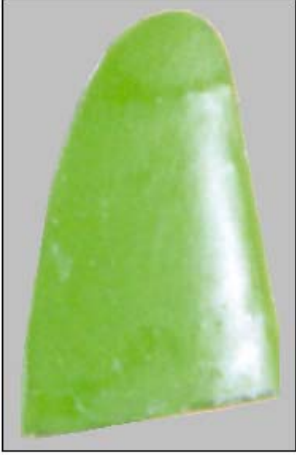




Figure 6 An example of different fins designed according to various NACA standards [10] and produced by laminating technique at Edith Cowan University in the 1st semester of 2004.

3. RESULTS AND DISCUSSION



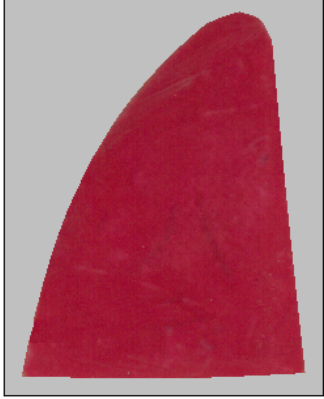



Experimental results relating to ECU fins and commercial fins are listed in Table 3. From Table 3 it is evident that the fin depth chosen varied from 90mm to 150mm with the majority of these values close to 100mm. The base length of fins was quite consistent ranging from 80mm to 110mm. It is necessary to note that the appropriate characteristic dimension for determining whether or not the boundary layer is turbulent should be a typical dimension in the direction of the flow, such as the base length of the fin. If one is going to be careful about the type of boundary layer, and use it to predict the likelihood of separation, then it may be better if a length is chosen that is representative of the distance to the point of maximum thickness, along a typical chord. In most fins, this distance will be about 2 to 4 cm (except at the tip of the fin) so that the Reynolds number will be $>100,000$. It could be argued that in the non-ideal conditions in the surf that the transition from laminar to turbulent flow will occur at or below this value. However, this is speculation at present. A turbulent boundary layer is desirable as it reduces the likelihood of separation. Consequently we used the full base length in the Reynolds Number calculations for experimental fins as shown in Table 3.


Table 3 Tabulated Results showing photographs of fins designed and produced at ECU (A to J) and 'as bought' commercial fins (K to M) with relevant design and 'predicted' performance data.

 <p style="text-align: center;">(A)</p> <p>Fin Depth = 100 [mm] Reynold's Number = 5.2×10^5 Fin Base = 100 [mm] NACA 66₂-015 Standard Surface Area = 74 [cm²] Aspect Ratio = 1.35 Lift Force = 9.4 [kg] Drag Force = 0.1 [kg]</p>	 <p style="text-align: center;">(B)</p> <p>Fin Depth = 90 [mm] Reynold's Number = 4.1×10^5 Fin Base = 80 [mm] NACA 66-015 Standard Surface Area = 45.5 [cm²] Aspect Ratio = 1.78 Lift Force = 6.4 [kg] Drag Force = 0.06 [kg]</p>	 <p style="text-align: center;">(C)</p> <p>Fin Depth = 100 [mm] Reynold's Number = 4.1×10^5 Fin Base = 80 [mm] NACA 0012-64 Standard Surface Area = 46.1 [cm²] Aspect Ratio = 2.17 Lift Force = 5.8 [kg] Drag Force = 0.06 [kg]</p>
 <p style="text-align: center;">(D)</p> <p>Fin Depth = 150 [mm] Reynold's Number = 5.2×10^5 Fin Base = 100 [mm] NACA 0012 Standard Surface Area = 129 [cm²] Aspect Ratio = 1.74</p>	 <p style="text-align: center;">(E)</p> <p>Fin Depth = 100 [mm] Reynold's Number = 5.2×10^5 Fin Base = 100 [mm] NACA 66-015 Standard Surface Area = 63.5 [cm²] Aspect Ratio = 1.57 Lift Force = 8.4 [kg]</p>	 <p style="text-align: center;">(F)</p> <p>Fin Depth = 100 [mm] Reynold's Number = 5.7×10^5 Fin Base = 110 [mm] NACA 66-015 Standard Surface Area = 66.5 [cm²] Aspect Ratio = 1.50 Lift Force = 8.2 [kg]</p>

Lift Force = 17.9 [kg] Drag Force = 0.18 [kg]	Drag Force = 0.095 [kg]	Drag Force = 0.093 [kg]
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Table 3 Continued from previous page

		
<p>(G)</p>	<p>(H)</p>	<p>(I)</p>
<p>Fin Depth = 110 [mm] Reynold's Number = 4.7×10^5 Fin Base = 90 [mm] NACA 66-015 Standard Surface Area = 75.7 [cm²] Aspect Ratio = 1.60 Lift Force = 9 [kg] Drag Force = 0.108 [kg]</p>	<p>Fin Depth = 120 [mm] Reynold's Number = 5.2×10^5 Fin Base = 100 [mm] NACA 66-015 Standard Surface Area = 70 [cm²] Aspect Ratio = 2.06 Lift Force = 10.65 [kg] Drag Force = 0.13 [kg]</p>	<p>Fin Depth = 100 [mm] Reynold's Number = 4.1×10^5 Fin Base = 80 [mm] NACA 66-015 Standard Surface Area = 60.8 [cm²] Aspect Ratio = 1.64 Lift Force = 7 [kg] Drag Force = 0.08 [kg]</p>
		
	<p>(K)</p>	<p>(L)</p>

<p>(J)</p> <p>Fin Depth = 150 [mm] Reynold's Number = 5.2×10^5 Fin Base = 100 [mm] NACA 66₂-015 Standard Surface Area = 98 [cm²] Aspect Ratio = 2.30 Lift Force = 12.3 [kg] Drag Force = 0.14 [kg]</p>	 <p>(M)</p>	<p>Fin Depth = 110 [mm] Reynold's Number = 5.7×10^5 Fin Base = 110 [mm] NACA 66-015 Standard* Surface Area = 93.7 [cm²] Aspect Ratio = 1.29 Lift Force = 13 [kg] Drag Force = 0.11 [kg]</p>
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Calculations for 10 different ECU fins indicated that Reynold's number was within the range from 4×10^5 to 6×10^5 . For the commercial fins the Reynold's number was $\sim 5.7 \times 10^5$. According to source [11] the fins could be expected to have a turbulent boundary layer, which is advantageous in promoting attachment of the boundary layer and delaying the onset of stall, reducing the likelihood of "spinning out" during turns.

The surface area of ECU fins ranged from about 46cm² to about 130cm². For the commercial fins it was about 94cm². Consequently, the aspect ratio for ECU fins ranged from 1.5 to 2.3. For commercial fins it was 1.3. Source [10] shows significant improvements in Lift/Drag ratio as the aspect ratio increases from 1 to 7. However, bearing in mind that the fin should not be extremely long it appeared wise to choose fins with a low aspect ratios, *eg* under 2, which correlated well with aspect ratios of both ECU fins and commercial fins.

For ECU fins the lift forces varied from 56N to 184N. For commercial fins it was 114N. For ECU fins the drag forces varied from 0.73N to 2.04N. For commercial fins it was 1.78N. This first approximation does not take into consideration the effects of aspect ratio on the lift and drag coefficients. Equation 1.6 in reference [10] may be used to show that for the cases considered above, the drag increases by at least an order of magnitude when compared to the section data for an "infinite" wing. However, since the fins are similar, this was ignored at present.

It should be noted that further research in this area is needed. If we had supporting data for a number of different size (and successful) commercial fins, then it would be possible to state that there exists some relationship between the other shape factors, until we have data we cannot use this is a basis for predicting performance.

CONCLUSIONS

The main conclusions to be drawn from this study may be summarised as:

- (1) There are various fin dimensional features that affect forces acting on the surfboard. These features are mutually linked to each other and cannot be treated separately if the fin contribution to forces acting on a surfboard is to be evaluated as a whole system. A study of data in variety of sources indicated that they have a tendency of being rather descriptive, and provide limited or no quantities for quantitative comparison.
- (2) The process of mould and fin production developed at ECU is a relatively straightforward and inexpensive technique that may be used to incorporate accurate reproductions of published airfoil sections into surfboard fin design.

- (3) The laboratory experiments at ECU demonstrated that a variety of high quality fins can be designed and fabricated using equations and empirical data adopted from the literature.

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Bray, E. Yokkaichi University, Japan. The Use Of Information Technology In Japanese Higher Education: A Pilot Study

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ABSTRACT

This pilot study was done in a Japanese university to explore the use of IT (information technology), and the attitudes of students and teachers towards its use. This qualitative interview study looks at the use of Powerpoint, the internet, and distance education, and finds that IT is not being used widely. Possible reasons for this finding are explored such as a lack of infrastructure and support, as well as the social and cultural traditions that influence faculty and institutional use of technology.

INTRODUCTION

Japan, with the world's second largest economy, is well known for being the home of such technological giants as Sony, Nintendo, NEC, etc. Since the 1960s there has been a growing awareness throughout the world of the importance of technology as a driver of globalization trends. Efforts in many countries have been made to increase the use of technology in education, however, it is generally thought that Japan has been slow in utilizing technology in education compared to other developed countries (Fujitani 2003, Bachnik 2003.). There are those that are optimistic that during the next decade Japan's use of IT-based learning technologies will develop (Sakamoto 2002). Others, however, (McVeigh 2003) feel that the barriers to increased use of IT in education are substantial. The purpose of this qualitative study is to look at how IT (information technology) is being used in one Japanese university, and explores the attitudes of students and teachers towards its use. By no means an in-depth study, this pilot study was designed to identify some of the basic issues in relation to the use of technology in higher education, which could serve as the basis for further study.

This study was done at a small private family run university in central Japan, to be called Z University. This university has about 2,000 students and was founded 18 years ago as the final stage in the development of a school system that now has 5 schools that provide education for students from pre-school to university. Z University is a 4th tier school (lowest 25%) with two main faculties, Economics and Environmental/Information Sciences, with an 80% male student population drawing heavily from the surrounding area. The faculty, however, come from all over Japan, and I think are fairly representative of faculty in other institutions in terms of their approach to their profession.

METHODS

I interviewed two professors and four students from Z University during March 2004. I selected the two professors because I had heard that they were among the few professors in the school using technology in the classroom. I assumed that the students, a soon to graduate senior, and three soon to be seniors, would have had a variety of classes and experiences, and would be able to give me a general picture of IT use at the school, as well as have some opinions in regards to its use. All the interviews were done primarily in English, but some Japanese was used. Each interview lasted about an hour, and I have translated comments made in Japanese into English where necessary.

RESULTS

The first professor I interviewed, Prof. Ikeda (no real names are used in this paper), is a computer teacher who specializes in computer graphics and animation. He had worked at a large Japanese electronics company for 15 years and come to Z University when the new Environmental/Information Sciences faculty opened 7 years ago. He is an example of a professor that came to academia after working in industry. The more typical approach is to move from graduate school to university work, and the second professor, Prof. Shimura, rose to his position via this route to be an English professor who also teaches one Gender Studies class.

I began by asking the professors how they were using computers in the classroom. Prof. Ikeda used the white board considerably followed by some PowerPoint to do some lecturing in class about the area of computing being covered. Then he would have students do some work on a handout, and next he would show them how the software worked using a computer connected to a display. Finally, he would have students use computers themselves. He began to teach 7 years ago, and at first had used only the white board to accompany his lectures. He mentioned that he had then moved all his lecture materials to OHP (overhead projector) and later to PowerPoint. When I asked why, he answered, 'PowerPoint is more convenient than OHP' because it can be stored digitally and carried on a laptop.

He originally moved to using an overhead projector and then PowerPoint because he felt that including pictures, and diagrams with text aided his explanations. This idea that lecturing with PowerPoint, an OHP or the internet via a monitor is more effective because it combines text with images, was a recurring theme in all the interviews.

Theme 1 - Text and Images together (Multimedia) can facilitate learning

Etsuko (a student), for example, commented that,

'... also I like a lecture with an OHP slides and pictures. ...looking at the actual pictures it went into my head better.'

Takayuki (a student) commented,

'PowerPoint is more visually sophisticated. And it can have pictures that help us understand the lectures.'

Prof. Shimura commented,

'For example when I talk about gender identity disorders, when I don't use a computer and screen they can't understand, but when I use the computer and screen students can look at the picture. After class students are interested in the topic they can use links and get more information.'

I next spoke with Prof. Shimura who is a particularly strong advocate of computer use both in his lectures and by students. He teaches students that are often bored by English study. He said,

'Actually it is very difficult for me to motivate them to study English as many didn't study in high school and are not interested in English but before I began to use the computer I gave some materials, movies, songs, but some were not interested in songs and movies, but when I teach students to use the internet and there are a lot of interesting things written in English, not what I give them but they have their own interests, so in my class I teach them how to use the internet and find info about what they are interested in. So in my classes if you can read English, you can find a lot of interesting things. For that purpose the computer is useful.'

Specifically, he describes how he runs his class,

'I use internet and MS Word every time because students are requested to take notes every time and send the notes as an attachment to me via email. Sometimes I use Excel because I think it is important for students to get information from internet. I ask them to get info on companies or racism and could you put this information into some kind of

graph. It is not difficult it is very easy. So when students find some pages and get some info about racism they find the info and the page is written in English so they have to read it and change it into a graph'

Prof. Shimura is very enthusiastic about using the internet in his classes, but he has had to come up with solutions to problems that have arisen. For example, he describes above how he now asks students to send him an email every day with some English sentences that they have found or written as a summary. Before doing this he felt too many students were either sleeping in class or web surfing to Japanese web pages.

This leads to the 2nd theme – Theme 2- Professors have had to solve many problems in learning to effectively use technology in the classroom . In these interviews both teachers and students mentioned several types of problems that can arise with technology use. For instance, when Takayuki was asked if he had seen any problems arise with technology use, he replied, 'It depends on the skill of the teacher'. He mentioned that sometimes there was too much content in the PowerPoint slides, 'For me good teachers write only the important points and describe during the lecture time. I felt they had too much content. If I read the book I need someone to pull out the important points. We need to know what are the most important points.' His idea is that many of the PowerPoint Slides were too full of information, some of it unessential.

However the biggest criticism of PowerPoint was in regards to the speed of the lecture. Both students felt that compared to writing on the blackboard, PowerPoint lectures were done too quickly. Ayako (student) said,

'PowerPoint is difficult to remember the lecture and it goes too fast and I can't write it down.' (One specific teacher was mentioned),

'Ayako: 'Tabata-sensei used PowerPoint but it was very fast and we could not read it.

Eric: Did you think to say that he should slow down?

Ayako: We did but he kept talking so fast.'

Takayuki put it another way,

'I don't know but I feel that the advantage of the blackboard is we have time to write down, but with the OHP and PowerPoint it is already prepared. With the blackboard the teachers are writing so we have time to write down and take a note. It is really good for us.'

Interestingly, Takayuki did mention that he thought that PowerPoint and OHP lectures were better prepared than lectures at the blackboard, but both students mentioned instances with PowerPoint when they had to write so fast that they couldn't think about what was being said. This is an example of when a lack of teacher skill with technology was a limiting factor in its success.

In the course of doing the interviews I confirmed that IT use was fairly rare at our university. Actually, a survey would be the most appropriate way to determine the exact extent of technological use, however, I did ask both professors how many other professors were using technological enhancements in their classrooms. Prof. Shimura thought that there was only one other teacher in the Economics faculty using a computer to give lectures, and he was part-time. Prof. Ikeda thought that few were using computers, while most used a blackboard and some an overhead projector (OHP). Students backed this up. Takayuki estimated that 20% of the teachers he studied with in the faculty of Environmental/Information Sciences used some kind of technological enhancements, but that 50% of these had only done so in the large 'gairon classes' (special lectures given twice a year) taught in two specially equipped classrooms.

One obvious reason for this fairly limited use of technology is another theme – Theme 3 - the infrastructure and support for use of technology is not strongly developed at Z University. Both professors had needed to specifically request to be able to teach their classes in computer-equipped rooms. There are a limited number of rooms with computers in them, and among these rooms only a few are supplied with a monitor that the teacher can use to connect a computer to. In any other room if a teacher were to want to

use an OHP unit or a screen and projector for a computer, these items would have to be reserved and carried to class by the professor. There are two large lecture halls in one of the new buildings that are set up with a screen and connections for laptops and each teacher in the faculty of Environmental/Information Sciences has to give 2 lectures per year to 150 or so students (called 'gairon'). This is the occasion when teachers are most likely to use PowerPoint or the computer to aid their lectures. However, in regards to training, both teachers answered that there had been no formal training offered by the school in how to do PowerPoint or use the computer in classrooms. Despite the lack of infrastructure and encouragement or training from school sources, both of these professors have gradually incorporated technology into their teaching and, by trial and error had developed methods that worked with their students.

Another theme to emerge was in relation to distance education, or lack thereof. Theme 4 – Distance education may be in conflict with basic Japanese values regarding the educational experience. In regards to distance education, Z University offers one course that is broadcast via satellite from a school in Tokyo that students can attend in one of the large lecture halls. There is also a TOEFL course that students can do online through the computer center. When asked, Etsuko said that distance education 'sounded interesting' and briefly contemplated the advantages of being able to avoid certain people on campus, but concluded that coming to school was better overall. She thought that taking notes from lectures was a better way to learn than from reading online.

Prof. Ikeda said he was considering putting up a webpage for his courses so that students that miss classes could 'find out what happened in class and prepare for the next class'. We discussed how this might encourage even greater problems with attendance. He was also interested in setting up a course that could be done from home for older students. However, in regards to typical students, he felt that particularly as the ability level of students seems to be falling in our school, more direct interaction in smaller classes would be useful. Undergraduate education in Japan is mainly for those 18-22 years of age. The undergraduate years in Japan are more valued for the social experiences they provide than the knowledge or skills acquired, and distance education is viewed as weak in this regard in comparison to the traditional Japanese view that values face to face interaction. Prof. Ikeda concluded, 'If we depend only on technology it is not good. We should basically teach by interaction and talking using a white board. These technologies are secondary tools.'

The previous quote is interesting coming one of the most active users of IT in the university, and has some relation to Theme 5 – There is concern that Powerpoint and computers used to display information in the classroom are thought to lead to student passivity. All interviewees, except Prof. Shimura, were worried that looking at a screen for too long during class would induce passivity or even sleepiness. Actually, this theme started to emerge before I did my first interview. I originally hoped to interview Prof. Yamada who I remembered had used OHP and PowerPoint in lectures a few years ago. I approached him about a possible interview and he said he no longer used PowerPoint and the OHP because it seemed to make his lectures boring to students, and he found more of them sleepy in class than if he used the blackboard. He had gone back to waving chalk at the front of the classroom and writing on the blackboard, because it worked better for him. He recommended I speak with Prof. Ikeda, and although Prof. Ikeda uses PowerPoint, he was also quick to tell me that although he used PowerPoint in every class, he was careful not to overuse it. He said, 'The most important point is writing on the blackboard and having students take notes. Just using PowerPoint and the OHP turns the students passive and they might fall asleep. So taking notes, moving the hand, maybe doing handouts and practice activities has to be done'

He seemed very concerned that I not have the impression that he just lectured from PowerPoint slides in his classes. On one hand this shows his skill as a teacher and his understanding of the proper role for Powerpoint in his class. It may also reflect his concern for fulfilling the Japanese ideal of a lecturer that can stand in front of a class and count on his knowledge and, more importantly his character and presence

to command the attention of the students, rather than rely on technological aides. He conceded that with higher-level students in better universities, longer lectures with PowerPoint might be possible, but that, 'Our students are better with the blackboard and printed handout exercises.' He felt this keeps less able students more active and engaged. Interestingly, one student had a similar idea, Etsuko said, 'My best technology is when the teacher talks and puts the important points on the board. And I can take notes. PowerPoint is difficult to remember the lecture and it goes too fast and I can't write it down'. This was the same student that said she felt that combining text and images in lecture helped her learn.

Both these professors were 'early adopters' of technology at our school and were learning how to effectively use these technological enhancements by trial and error, and were gradually learning, (or not learning (Ex.- Prof. Tabata), or had given up trying to learn (Ex.- Prof. Yamada). Prof. Ikeda, for example, had learned to mix PowerPoint with other types of activities, some active, some passive, in class to keep students from becoming too passive or sleepy. Prof. Shimura had learned to require that students do follow up tasks that required them to transform information they had found into graphs or a written summary and send it to him by email. This helped avoid that vexing international problem of student computer use, directionless web surfing. Clearly, the use of IT in the classroom does not automatically result in better learning and teaching, it requires skill to utilize it effectively.

DISCUSSION

The purpose of this study was to see how IT was being used in a Japanese university and explore some of the attitudes towards its use held by teachers and students. Through interviews I hoped to learn firsthand what Japanese teachers and students saw as the benefits and difficulties of using IT. Overall, one gets the sense IT is not used much in Z University. Yoshida and Bachnick (2003) looked at survey data from a study of Japanese universities done in 2001 and found this to be the case nationwide. Whereas 99% of Japanese universities were connected to the internet in 2000, the survey found that 11% of faculty was providing teaching materials via the web. Large rooms of computers connected to the internet are a common site on Japanese university campuses, but they seem to be rarely used by students for projects or homework. The exception would be computer classes themselves, especially those in the technological universities.

At Z University the lack of classrooms set up for IT use was seen as being a barrier by faculty. Also mentioned was the lack of technical support. This point is corroborated by Bachnik (2003) in her book, 'Roadblocks on the Information Highway' where she writes at length about how in Japan, 'faculty need to do IT themselves' citing a survey where 95 % of faculty responding to a survey saw 'lack of technical support staff' as a barrier to IT use. In fact, what support that does exist is generally related to hardware. To date there had been no training provided at Z University to train teachers to use Powerpoint software, much less on how to integrate the use of computers, the internet, etc. into the curriculum.

Bachnik discusses at length the lack of emphasis on pedagogy in discussions about IT use in Japanese schools. Pedagogy is an area where higher education faculty are primarily left to their own devices. In my interviews, I steered the discussion to this area and was interested to find that each professor had been working in isolation, gradually implementing procedures and learning how to best use IT by trial and error. Prof. Ikeda had been a bit more traditional in his approach, using Powerpoint and the computer to aid in giving explanations. Prof. Shimizu, on the other hand, was not only using the internet to make his lectures more interesting, but was also asking students to do research on their own, and then requiring them to report their results back to him via email. The other teachers mentioned in the study who had not been successful with IT, had mainly wanted to import the computer into a traditional teacher-centered lecture-based class using Powerpoint or a computer display. This had not been successful because they felt they were boring students. This highlights the fact that the use of IT imported into the traditional teacher-centered curriculum does not necessarily lead to greater success. The better approach is to use the

computer as one aspect of a multifaceted approach to teaching a class (Prof. Ikeda) or to take advantage of the computer's unique abilities and allow it to transform one's way of teaching (Prof. Shimizu).

In addition to the lack of networked classrooms there seems to also be a lack of a understanding by teachers and administrators of how computers can best be utilized to enhance the learning experiences of students. Traditions are strong in Japan, and the mental model for university education at the undergraduate level is with a teacher at the front of the class lecturing and students taking notes. From discussions with both faculty and students, the benefits of multimedia instruction added to lectures are appreciated by all that had experience with it. However, teachers who have not had this experience would need to imagine the benefits, and then compare these to the costs of transforming their lecture notes into Powerpoint slides. I am not sure they will feel inspired to make the change.

Regarding online distance education, my sense is that many Japanese teachers have difficulty imagining using computers to teach in ways that stress student-centered methodologies, such as self-directed research, and communication/collaboration online. There appears to be little knowledge of software like Blackboard and Lotus notes that make communication and collaboration between class members possible. Since the Japanese higher educational experience is strongly oriented towards face-to-face undergraduate education, and particularly the extra-curricular experiences during the four years, it may be difficult for many to feel much attraction for online distance education as it is currently envisioned. Online distance education was mentioned as a possible way to reach older working people, but this professor's idea was to video record lectures and make them available on a class website, following the traditional teacher - centered model.

Looking at culture, Hofstede (1997) performed an analysis of IBM survey data from 50 countries and found that relative to Americans and British, Japanese were more 'collectivist' than 'individualistic' in orientation. The image of students studying alone at home via the computer communicating directly with a professor may seem overly individualistic and only appeal to a limited number of students. Currently, distance education is provided by the national government via satellite to nearly 80,000 students in their homes on television and radio broadcast, but many of these students are older students, in rural areas studying for interest rather than a degree.

With a lack of push towards new educational directions utilizing computers from the top down, i.e. the Ministry of Education or institutional management), and only isolated individuals working by trial and error to develop innovative curriculum utilizing computers bottom up from within the teaching ranks, it is easy to see why the pace of innovation has been slow in Japanese higher education. However, changes are occurring in the external environment surrounding Japanese universities, which very well may stimulate greater use of IT in higher education.

One change is the gradual move worldwide towards student-centered teaching methodologies, which are well suited to online education. In addition, Japanese industry, long happy to hire 'generalists', is increasingly demanding that job applicants be better prepared with tech related skills. In the past, universities have functioned more as a sorting mechanism on entrance rather than providing substantive education and training before exit. Japanese industry, however, may be moving away from lifetime employment system where it makes more sense to retrain older workers than hire new ones that already have the desired skills. Finally, demographic changes are making it necessary for schools to compete for decreasing numbers of 18 year olds. After reaching a peak of 2.5 million 18 year olds in 1992, there has been a steady decrease in numbers to an estimated 1.2 million 18 year olds in 2010 (Doyon 2001). The Ministry of Education is looking at all these trends, and has decided to privatize its highly ranked national universities, which is creating an even more competitive environment for universities struggling to fill

classrooms. It might be that increased use of IT in the classroom will be seen as a way to attract students, inspiring faculty to develop in this area or universities to promote development here.

CONCLUSION

At a policy level, all countries are struggling with the conflict between on one hand wanting to take advantage of the power of new technologies to improve educational services, and on the other hand preserve what is of value in traditional teaching methodologies. After a slow start, it seems likely that IT use in Japanese universities will increase over the next decade. It would be interesting to explore further what faculty and administrators view as the incentives and obstacles to greater use of technology in the classroom, including the place that online distance education might play in Japanese higher education.

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The Conceptual Framework of Dynamic Interactive Visualization Tool in Teaching Data Structure (DIVTIDS)

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ABSTRACT

The Dynamic Interactive Visualization Tool in teaching C (DIVTIC) was developed as an alternative teaching approach, based on constructivist learning principles, and multimedia technologies. DIVTIC uses multimedia and visual imagery to provide learners with a step-by-step representation of program executions in the C language as a means to enhance their understanding. The study of DIVTIC in Chansilp & Oliver (2002) and Chansilp & Oliver (2004) found that students made significant use of the tool and its various elements as a support for their learning.

Data Structure is one of the core courses for students who major in computing as well as C programming language. This course causes troubles to students because of its too abstract and complexity. This course is about how to program efficiently by applying various types of appropriate abstract structures, for example, linked list, stack, queue, tree, graph, etc. The promising result of DIVTIC signals that the concept of visual imagery of DIVTIC would help students enhance their visualization in learning Data Structure.

Therefore, this paper describes the conceptual framework supporting the design of the Dynamic Interactive Visualization Tool in teaching Data Structure (DIVTIDS). DIVTIDS was designed around DIVTIC, constructivist principles, and collaborative and visualization learning strategies with use of the Internet and the World Wide Web to support the learning of abstract structures. Furthermore, each kind of structures will be represented graphically and animatedly along with the concept of DIVTIC.

INTRODUCTION

Data Structure is a core unit for every single student who studies in both computer science and computer engineering. This unit aims students to develop algorithms or programs with appropriate structures to produce the efficient process. The contents of the unit include the abstract data types, for example, linked list, stack, queue, tree, and graph. Students should be able to apply these abstract data types to their program to make it more efficient in terms of using the appropriate structure and reduce timing. Therefore, not only the ability of programming is important for novices, but also the knowledge about applying appropriate data structures to their programs is necessary for them.

Chansilp & Oliver (2002) and Chansilp & Oliver (2004) develop The Dynamic Interactive Visualization Tool in teaching C (DIVTIC), an interactive learning tool for introductory programming. It was designed to help students to learn programming through the provision of a raft of useful resources supported by a tool to visualize and conceptualize programming constructs. A study of DIVTIC was implemented with learners and data gathered to explore their levels of use of the various tools and their degree of acceptance

of the tool as a support for learning. The results from the study demonstrated that students made significant use of the tool and its various elements as a support for their learning. There was considerable in that the animation tool being the element most used. The findings from the study also found that the tool is a strong online support for the teaching of this subject and is an appropriate choice as learning support.

The papers also mention that DIVTIC can help students to visualize the abstract of programming by showing the following four sections simultaneously: the code section, the memory section, the monitor section, and the message section. This visualization helps students in that they do not have to think of these four parts imaginatively. This concept would be applied to teaching and learning Data Structure as well as programming in C. However, before developing the visualization tool in teaching Data Structure, the conceptual framework should be constructed to be appropriate to the nature of the course. Therefore, this paper will focus on the concept of developing the Dynamic Interactive Visualization Tool in teaching Data Structure (DIVTIDS).

LITERATURE REVIEW

Computer programming is an area that contains complex knowledge and abstract concepts that need individual mental effort to learn and understand (Jehng and Chan, 1998). Learning computer programming involves several cognitive abilities including syntactic knowledge, conceptual knowledge, and strategic knowledge (Bayman and Mayer, 1988). Students in science majors, especially in the computing, need to learn valid programming concepts during their introductory computing courses because these form a strong background for more advanced programming courses in their university curriculum (Herrmann and Popyack, 1994). Students' problems are mostly based on the lack of conceptual understanding and mental models (Soloway et al., 1981). Commands in a programming language are not the same as in the everyday use of the English language and mathematics. Rather, they must be specific and follow exact rules of the programming language so that they can be compiled and executed correctly. Novices need to be able to visualize what is actually happening inside the computer memory when each statement of a program is executed.

At the moment, much of the teaching is based on textbooks and this does not always work well. Kann et al. (1997) suggest that the graphic representation of algorithms used in most textbooks are too abstract and insufficient for learners to develop the logical thinking required in computer science courses. Many students who finish introductory classes, are still weak in their understanding of basic concepts. Generally, students differ in their ability to understand material that is very abstract and difficult to visualise. Kann et al. (1997) claim that the graphic representation of algorithms used in most textbooks are abstract visualizations and not sufficient for learners to develop logical thinking skills required in computer science courses. Previous research has proposed ways to improve instructional materials and therefore student outcomes. For example, instruction can incorporate a dynamic explanation tool to help students visualise each step in program execution (Karsten and Kaparthi, 1998, Rowe and Thorburn, 1999, Lischner, 2000). This provides an opportunity to investigate ways to enhance learning through the informed use of contemporary graphics programs.

A frequently cited statistic is that "People generally remember 10 percent of what they read, 20 percent of what they hear, 30 percent of what they see, and 50 percent of what they hear and see" (Treichler, 1967, p. 15). Therefore, as the media used in educational settings comes in many different forms and formats, teachers need to understand the differences between media used in the classroom in order to select the optimum type (Rose and Meyer, 2002). Newby et al. (1996) present 11 types of media and provide the characteristics of each. These are presented in the following table (Table 1).

Table 1: Media characteristics (Newby et al., 1996, p. 147)

Types of Media	Visual	Color	Sound	Motion	Interaction	Tactile
Real objects and models	•	•				•
Text (books, handouts)	•	•				
Visuals (pictures, photos, drawing, charts, graphs)	•	•				
Display boards (chalk, bulletin, multipurpose)	•	•				
Overhead transparencies	•	•				
Slides and filmstrips	•	•	•			
Audio (tape, disc)			•			
Video and film (tape, disc)	•	•	•	•		
Television (live)	•	•	•	•		
Computer software	•	•	•	•	•	
Multimedia	•	•	•	•	•	

In addition, Najjar (1996) suggests that information must be put into the most appropriate medium for learning to be most effective. For example, information should be presented as follows:

- Assembly Instructions should be in textual format with supportive pictures;
- Procedural Information should be in the form of explanatory text with diagrams or animation;
- Problem-solving Information should be presented with animation and explanatory verbal narration;
- Recognition and Spatial Information should be presented with pictures;
- Small amounts of verbal information should be presented with sound; and
- Story details should be presented on video with soundtrack or textual format with supportive illustrations.

With emerging technologies, there are many ways to improve instructional materials and to help instructors and students improve the teaching and learning environment. This paper describes a conceptual framework to develop an instructional model using the most recent developments in technology as a means to enhance student learning Data Structure.

THE CONCEPTUAL FRAMEWORK FOR DIVTIDS

The conceptual framework for the Dynamic Interactive Visualization Tool in teaching Data Structure (DIVTIDS) is comprised of three major parts: form, content, and learning strategy. DIVTIDS is modeled as a multimedia-based learning resource to support visualization in teaching Data Structure.

The form of DIVTIDS was designed to take advantage of three main aspects of contemporary technologies:

- **Web-based instruction:** Web-based instruction has an advantage over the traditional face-to-face instruction because it is easier to update, more accessible, more flexible, and less costly (Brooks, 1997). Thus, DIVTIDS was planned to use Web-based instruction as a form to deliver course materials via the Internet.
- **Interactivity:** DIVTIDS was planned to use Flash as the major software platform to develop high levels of interactivity and feedback to support learning.
- **Modularity:** DIVTIDS is planned to include five modules based on the course material at Nakorn Pathom Rajabhat University (NPRU) including linked list, stack, queue, tree, and graph. Each module will show students each step of program execution. A marker would be used to animate each line throughout all the segments of each line of the program. The control buttons will be included in each

module. Students can interact with by clicking on the control buttons including Stop, Pause, Backward, and Forward buttons. This feature will enable students to access to any point of the program.

The content of DIVTIDS was planned to comprise six components:

- Algorithm-based in C programming language: The content was planned by using C programming language in teaching and learning Data Structure based on the requirement at NPRU. DIVTIDS was planned to provide students with visual representations of all the major algorithms in the course and for each algorithm that would:
 - show the computational process phase by phase;
 - show the graphical representation, input process, output process, and decision making process;
 - provide explanations of each step; and
 - provide the students with ability to control the process, to pause, go back, go forward;
- Virtual computer: DIVTIDS was planned to include as a virtual computer which could display an imitation of a computer monitor for displaying an output and an imitation of the graphical representation of the abstract data structures for displaying how the variables and their values were kept when students run an animation;
- Syntax presentation: DIVTIDS was also planned to provide a dialogue box to display each animation source code with a marker that ran through all segments of each line. This feature would allow students to look at the syntax, variable or keyword, and its explanation;
- Explanations: Some explanations were planned to incorporate with each animation a display of the meaning of each syntax, variable, or keyword when the marker ran past at any particular stage;
- Examples: Each module was planned to include three to four examples ranging from easy to difficult levels. This would benefit students with different learning abilities and motivate students with higher abilities to try more difficult problems; and
- References: DIVTIDS was planned to include references as supplementary resource for students.

The DIVTIDS system planned to employ five learning strategies:

- Interactive/Feedback: DIVTIDS was planned to provide interactive and immediate feedback which would encourage students to be active learners;
- Visual Representation: DIVTIDS was planned to use visual representation to help students understand programming concepts better by visualizing what is happening at each stage of the programming process;
- Forward/Backward Control: DIVTIDS was planned to include a control menu for students to use while they were watching the animation. This control menu would work in the same way as a video controller and was comprised of Play, Step-Backward, Step-Forward, Stop/Pause, Go to the End, and Go to the Beginning buttons. This feature would allow students the ability to control the animation process. It also would enable students to pause and think before watching a further step of the animation and this would provide an opportunity for students to become active learners.
- Learning from a Computer: Once the DIVTIDS system was installed onto the student's own computer hard disk, students could run the animation section regardless of the Internet connection.
- Supporting Normal Classroom Learning: DIVTIDS was planned to contain with all necessary elements needed to support normal classroom activity. But students could also use the DIVTIC system outside classroom at any time of the day, at their own pace.

FUNCTIONALITY OF DIVTIDS

DIVTIDS was planned to contain six sections and the relationship between DIVTIDS characteristics, forms of learning activity, and its contributions are shown in Table 2.

Table 2: The relationship between DIVTIDS characteristics, forms of learning activity, and its contributions

DIVTIDS Characteristic	Intended Student Use	Contribution to Learning
Syllabus/Lecture Notes: This was planned to be a set of course materials and relevant information. To assist in the knowledge construction process it was planned to allow students to manage their own time and construct their own knowledge.	Browsing, exploring, or inquiring when needed during trimester Preparing for lecture by downloading and printing notes ahead of time	Support of self-regulated activity Support for learner inquiry
Animated Examples: This was planned to be a set of animation examples which students could interact with by clicking on the control buttons at anytime. The animations would show students each step of program execution. A marker would be used to animate each line throughout all the segments of each lines of the program.	Browsing, exploring, or inquiring when needed during trimester Interacting with the animation process Observing the code at run time	Support of self-regulated activity Provision of feedback Support for knowledge acquisition Support for higher-order thinking Provision of multiple perspectives Scaffold for learning Support for learner inquiry Support for learner exploration Modeling of expert performance
WebBoard: This was planned to provide opportunities for students to communicate with their peers. This feature was planned to encourage individuals to share and change their ideas leading to an opportunity to discover, analyze, synthesize, and evaluate each other's thoughts. It was intended that students could post their questions and receive answers via the use of this feature.	Browsing, exploring, or inquiring when needed during trimester Seeking information Supporting peers	Provision of collaborative opportunities Provision of feedback Provision of multiple perspectives Support for knowledge sharing Articulation of idea
Self-Evaluation: It was planned to comprise of a set of multiple-choice questions which would cover all topics. It was also planned to provide a dynamic feedback window for students when they clicked on an answer.	Testing understanding when needed Knowledge acquisition	Support of self-regulated activity Provision of feedback Scaffold for learning Support for learner exploration Articulation of idea
FAQ Pool: This was planned to be a knowledge-based pool that contains frequently asked questions (FAQs). This feature was intended to provide students with easy access to some common questions which peers have asked and their answers.	Finding common frequently asked questions Seeking responses to problems	Support for learner exploration Support for learner inquiry Expansion of knowledge base Scaffold for learning Modeling of expert performance
References & Links: This would be a kind of information pool, which would assist students in constructing their own knowledge by searching for relevant references on the server and the World Wide Web.	Browsing, exploring, or inquiring when needed during trimester Investigating syntax and algorithms	Expansion of knowledge base Provision of multiple perspectives Support for learner inquiry

THE DESIGN AND DEVELOPMENT OF DIVTIDS

The design of DIVTIDS was based on the learning principles necessary for successful programming learning. The instruction is planned to design as a Web-based application using the Internet as a delivery medium. The essential elements needed for computer programming are Student centred, Interaction, Linking syntax and semantics, and Strong visual orientation.

This form of learning setting needs to be designed around a framework comprising learning tasks, learning supports, and learning resources. Methods of visualization, collaboration, constructivism, and student-centred learning are used to explore how the design can benefit teaching and learning in introductory computer programming. DIVTIDS was designed to be more visually explicit than the existing systems (e.g., (Rowe and Thorburn, 1999)). DIVTIDS shows phrases in each line and employs a combination of

complementary tools that encourage students to be active learners. To ensure that the students' use of DIVTIDS was consistent, a weekly task was designed. Students were to be given a weekly task to complete in the laboratory which would require them to log into the DIVTIDS system to explore how a program would run and to produce its output. Students would do this by selecting and playing the relevant animation for the task.

As the Animated Examples section is the most important section, there is a need to describe its features in more detail. The animations will show students each step of program execution. A marker will be used to animate each line throughout all the segments of each line of the program. Animation examples will be divided into three different levels of difficulty: (a) easy and short animations, (b) average difficulty animations, and (c) long and complex animations. The dynamic illustration of DIVTIDS was planned to conform to Rowe and Thorburn's (1999) contention that illustrations should be made clear to students to assist them to feel comfortable about writing programs. There are four panels in each animated example including C Source Code, Message Board, Monitor Output, and Graphical Representation panels (see Figure 1).

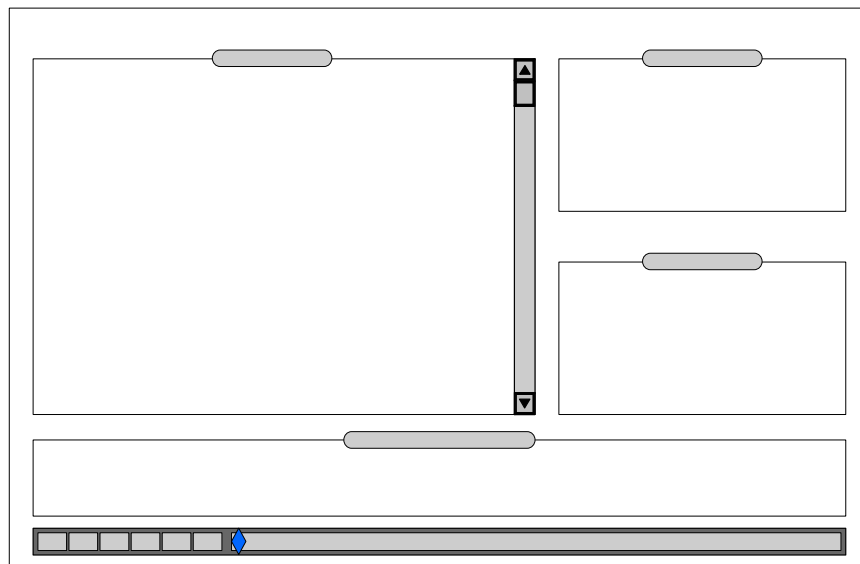


Figure 1: Panels of animated example in DIVTIDS

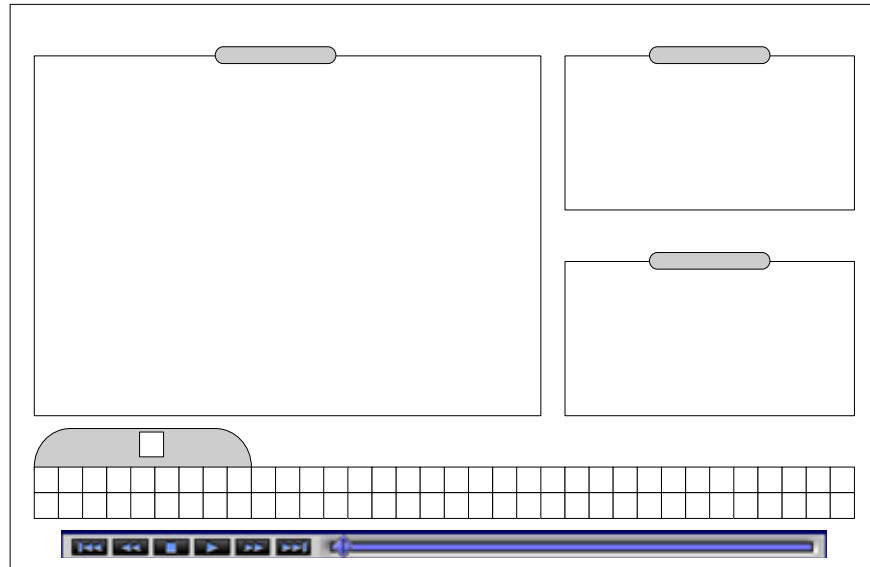
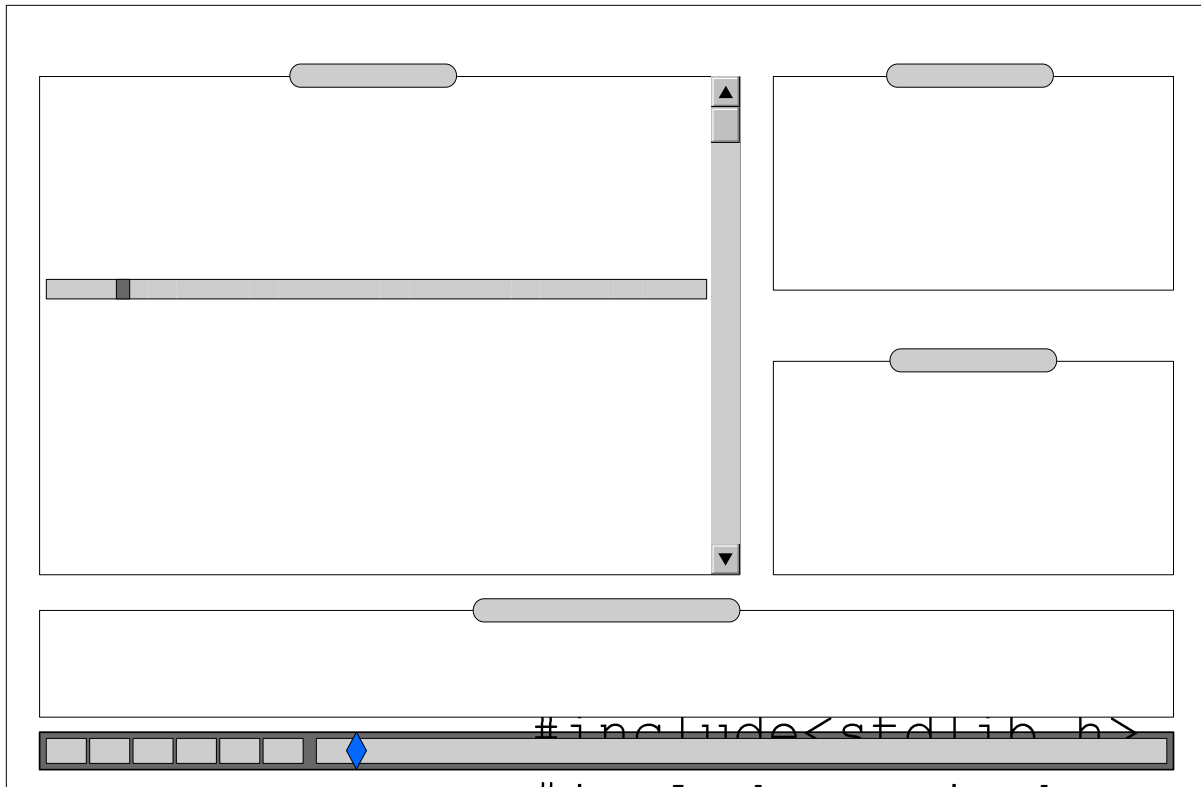


Figure 2: Panels of animated example in DIVTIC

These are different from DIVTIC which is composed of C Source Code, Message Board, Monitor Output, and Memory Mapping panels (see Figure 2). This change is the result of the different of students' experience. Students studying programming in C are first year students which are novices. They have no idea about the memory usage of different variable types, so the Memory Mapping panel could help them in terms of memory visualization which is quite difficult to understand for novices. The Data Structure course is for second year students who have some experience in programming. They had ideas about the memory usage, so the panel of the Memory Mapping is not necessary for them anymore. However, the obstacle they faced is the visualization of the abstract structures. Therefore, the Graphical Representation panel was added instead.

The characteristic of each panel (Figure 3) is described as follows:



Source

Figure 3: An example of four panels of an animated example in DWHS

- Source Code: A Source Code panel will display a given problem with a button to link to its solution in C source code format. This feature will encourage students to pause, think, and solve the problem. Clicking on a button would allow them to compare a given result. This would encourage students to be active learners. In this section, students test their understanding by clicking on each topic. The students can then do the self-assessment test by selecting an answer. JavaScript was used to create an immediate feedback feature that pops-up right after an answer has been selected.
- Message Board: A Dynamic Explanation will provide some explanations on the behavior of the marker. This was aimed at helping students to develop a valid mental model.
- Monitor Output: A Synchronize Output Screen panel will represent a virtual device used to display the output at each point where the marker is placed. To make it realistic, this screen was planned to design to sit on top of the Simultaneous Dynamic Graphical Representation panel.
- Graphical Representation: A Simultaneous Dynamic Graphical Representation panel will display the result of the code affecting the memory to help students develop mental models of how the computer stores data/variables and their values. When the marker runs through the declaration section in the source code, the equivalent section in the Graphical Representation would be displayed. The images depending on the particular type of abstract data structures will be assigned to them individually. For example, the node of a linked list will be assigned by two concatenated boxes. The first box contains the data item while the second box contains the arrow (to represent address or pointer) to link to the next node (Figure 4 and Figure 5). Values or pointers will be displayed and changed according to the process. This dynamic visualization was aimed at enhancing students' understanding of how these abstract structures has been allocated and changed.

```
#include <stdlib.h>
#include <conio.h>
#include <ctype.h>
void main() {
    struct ListNode {
        int data;
        struct ListNode *next;
    };
    typedef struct ListNode
    LISTNODE;
    LISTNODE *LISTNO
    LISTNODEPTR; startPtr, cu
    char choice;
    int num;
    clrscr();
    startPtr = NULL;
    do{
        printf("Enter a ch
```

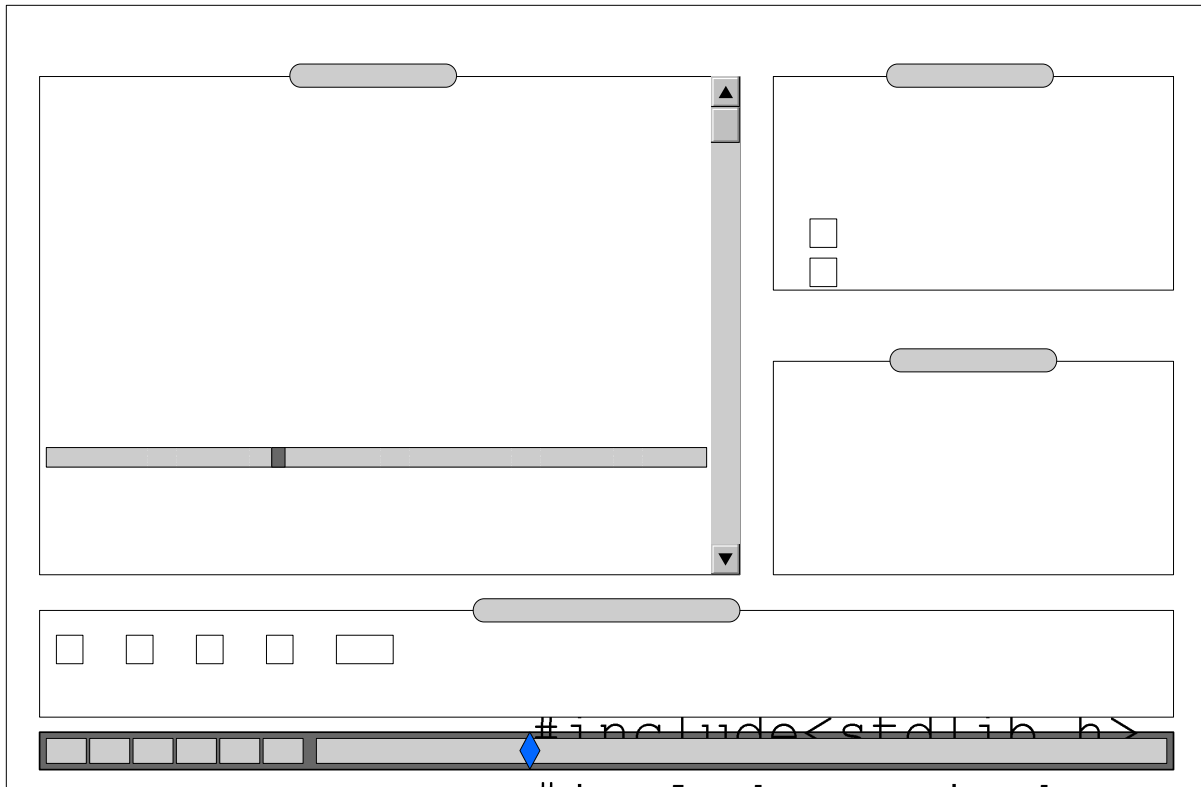
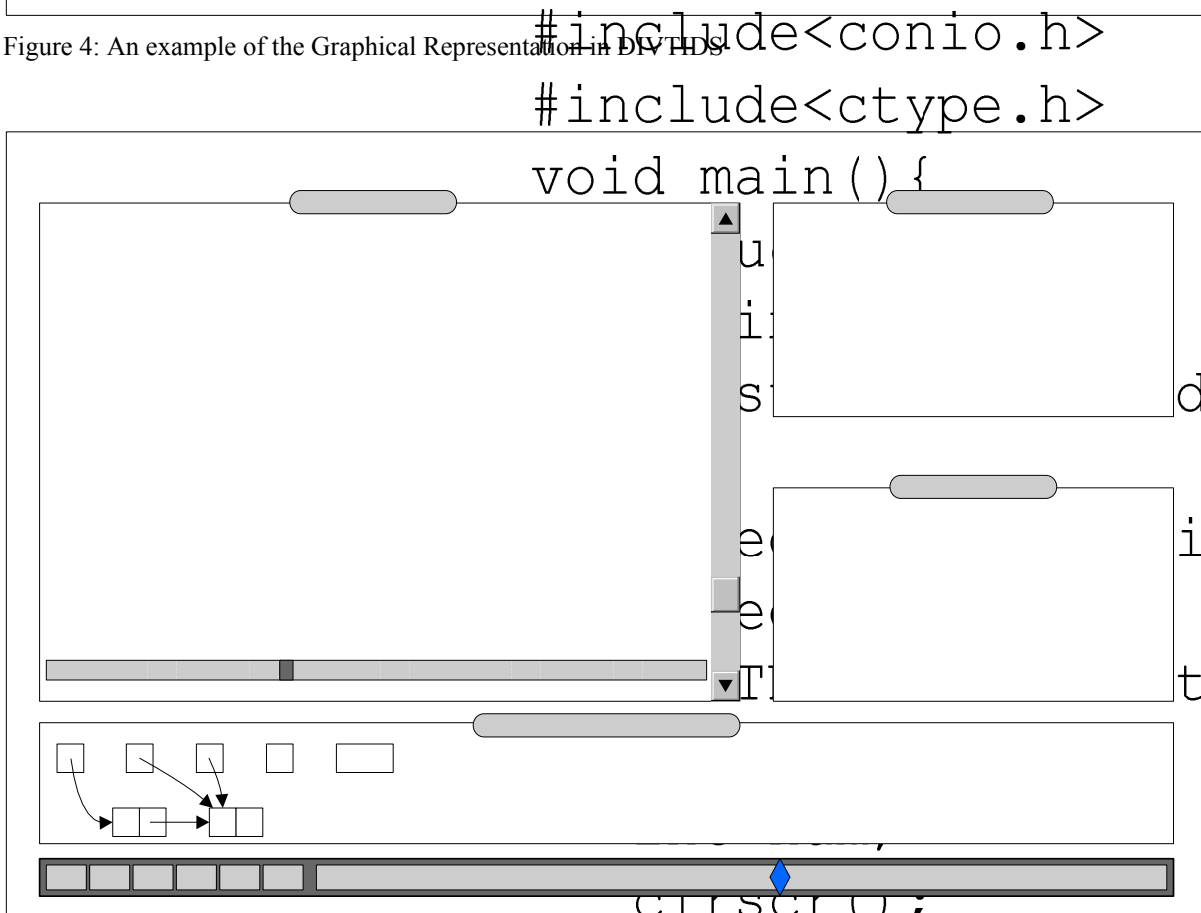


Figure 4: An example of the Graphical Representation in DV FDS



Sour

de *next

istNode

*LISTNO

tPtr, cu

clrscr();

startPtr = NULL;

do{

printf("Enter a ch

Figure 5: An example of four panels of animated example in DIVTIDS

SUMMARY AND CONCLUSIONS

This paper describes the conceptual framework supporting the design of the Dynamic Interactive Visualization Tool in teaching Data Structure (DIVTIDS). DIVTIDS was designed around DIVTIC, constructivist principles, and collaborative and visualization learning strategies with use of the Internet and the World Wide Web to support the learning of abstract structures. Disparately from DIVTIC which is suitable from novices, the design of DIVTIDS has been evolved to suit to the experience learners and the contents of Data Structure by graphically and animatedly representing each kind of abstract data structures.

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ABSTRACT

When visiting a Web site by using a vulnerable browser, a serious system security breach may occur. This paper will first try to inform the community of such incidents. The exploitation occurs after a special code has been implanted into the page and is subsequently accessed by a web browser. The main concern to us is the unauthorized alteration of our web pages. The effect of an infected web page of this nature, is often the loss of credibility and reputation with our users. WIC can be used to detect unauthorized changes to web pages. WIC is a detection tool that runs on the web server. It detects changes to web pages made in a selected time span. When a change is detected, WIC provides an incident report and can recover to a known state, by uploading and replacing the faulty page with the original one.

INTRODUCTION

Nowadays, the Internet has become part of our lives. The World Wide Web has brought a lot of security-unaware users like us into remote access technology (Gollmann, 1999). On our desks, we now have computers connected to the Internet. We use browsers to search for information, much like using a library, but in a much shorter time frame. Most organizations, agencies and companies create web sites to advertise and educate. Educational institutions also use web sites to provide information, utilizing a wide range of communications. Experience provides us with the knowledge that enables us to set up faster, cheaper and simpler connections. A vulnerable network may appear invulnerable for a long period of time, but when an attack is made, the vulnerabilities are soon evident. Examples of hacking and web page defacement are common and regular. For example, in August 1996, United States Department of Justice web-site was hacked and defaced (Hacked: DOJ, 1996) and in January 2001, government Web sites in the United Kingdom, Australia and United States were defaced (Leyden, 2001), and again in December 2003, thirteen NASA Web sites were defaced. Many things that seem impossible can and do happen.

When a web-site is defaced, its Web page is changed. Browser vulnerabilities causing high security risks are commonly reported. McWilliams (2002,para.2) stated that 'By coaxing IE users to view a web page containing the special code, an attacker can silently force Windows 98, Windows 2000, or Windows XP users to run a malicious program of the attacker's choice'. What if the 'attacker's choice' is a program containing a virus, spyware or a backdoor? It has also been shown in a Laboratory that special codes can cause hard disks to be formatted without user consent. There are numerous problems with browsers. A search for IE vulnerabilities at securiteam.com returns 27 reports. It is simple to recognize that defaced web pages can cause loss of confidentiality. It is also obvious that embedded malicious code can also

cause our reputation to diminish due to adverse effects, such as viruses being transferred to our users' hardware.

The problem is that securing a web site, free of vulnerabilities is an extremely difficult task. Unfortunately, all browsers are open to some form of vulnerability. When a security solution is found for one problem, another security risk has developed. Imagine what would happen if our students visited our web site and a specially crafted code (malicious in intent), had been inserted into the page by an attacker, causing hard disks to be erased or infecting all their PCs with a virus. Since many respectable web sites have been hacked and defaced (Gaudin, 2003), it might be presumed that an unauthorized entry into our web sites may not be as difficult as we imagine. We should, therefore, be prepared for such an event. One means of protection is to make periodical checks to determine if our web pages have been altered, and create the necessary incident reports ensuring that the Web Administrator is made aware of such occurrences. With this knowledge the administrator could then repair or replace the damaged files, and maintain a high standard of system integrity. One available tool to aid in these processes is WIC.

THE ENGINE

We will examine the means of web page integrity checking. According to good security practice, the verifier should not be located on the web server holding the web pages to be monitored. Consequently, we create a validation server. Both administrators, and users, can setup and manage their requirements via the web. This necessitates that not only will the validation server verify web pages on the web server, but it will also validate itself. WIC supports a login page for both administrator and end-user as shown in Figure 1.

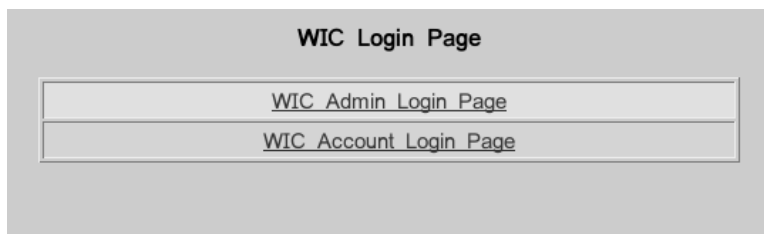


Figure 1: Login Page

Administrators can login via WIC Administrator Login Page and users can login by selecting WIC Account Login Page. At login, the server will display the relevant login page, and will validate the signature of the web page specified by using MD5 (Kaero, 1999). If it is an initial setup, the MD5 value will be stored in the database. Subsequent checkings will be validated against this entry. This entry will be checked periodically and if it has been changed, action will be taken corresponding to the users requirements. Figure 2 shows available actions.

Set up checking properties

<input type="checkbox"/> Ftp upload	Ftp host	<input type="text"/>
	User name	<input type="text"/>
	Password	<input type="text"/>
	Dir	<input type="text"/>
<input type="checkbox"/> Web upload	Web link	<input type="text"/>
	User name	<input type="text"/>
	Password	<input type="text"/>
	Dir	<input type="text"/>
<input checked="" type="checkbox"/> Email alert	Email address	ss@localhost
	Msg	U R hacked!
<input type="checkbox"/> Sms alert	Cellphone num	<input type="text"/>
	Msg	<input type="text"/>
<input type="button" value="Submit Change"/>		

Figure 2: Action when Web page is changed

ADMINISTRATOR MODE

WIC allows many administrators to be defined, however, only one, the first entry, will be classified as the main administrator. The main administrator can add other WIC administrators by adding WIC administrators and can add users by adding accounts. The main administrator can also backup and restore the WIC system. (See Figure 3).

Welcome to Web Integrity Check			
Monday, 27 September 2004, 06:26:48		More Info	admin: ad --> Logout
Home	Backup WIC System	Add Account	Contact Account
Add WIC Admin	Restore WIC System	Edit Account	Contact WIC admin
Edit WIC Admin	Display Admin Log	Display Account Log	WIC Admin Manual
Display WIC log			

Figure 3: Administrator Menu

Every action the administrator performs is logged and can be displayed (see Figure 4). The administrator can also view other users' logs. The administrator can contact other administrators (Contact WIC admin) and any user (Contact Account). This is performed via e-mail generated by WIC. The primary difference between the main administrator and the other administrators is the ability to backup and restore the WIC program. No secondary administrator has this privilege, however, they are able to backup and restore the database.

No.	Time	From IP	Action
1	Monday, 27 September 2004, 06:27:54	127.0.0.1	Display admin log: main admin ad
2	Monday, 27 September 2004, 06:27:48	127.0.0.1	Display admin log: main admin ad
3	Monday, 27 September 2004, 06:27:25	127.0.0.1	Display admin log: main admin ad
4	Monday, 27 September 2004, 06:25:57	127.0.0.1	Login
5	Monday, 27 September 2004, 06:25:00	localhost	WIC server is up
6	Monday, 27 September 2004, 06:24:10	127.0.0.1	Logout
7	Monday, 27 September 2004, 06:23:20	127.0.0.1	Login
8	Sunday, 19 September 2004, 08:30:00	localhost	WIC server is up
9	Sunday, 19 September 2004, 08:25:00	localhost	WIC server is up
10	Sunday, 19 September 2004, 08:20:00	localhost	WIC server is up

Figure 4: Administrator Log

ACCOUNT MODE

The administrator needs to create accounts prior to use. After an account is created, the user for that account can login and setup their checking requirements. After logging in, the user can perform many tasks (see Figure 5). Examples include changing account information, adding and deleting links designated for checking, enabling and disabling checks, displaying the activity log, setting actions for the server to take after a web page has been compromised, setting check schedules (see Figure 6) and contacting administrator by sending e-mail.

Welcome to Web Integrity Check				
Monday, 27 September 2004, 06:33:51		More Info	Link checking: Disabled	acct: ss --> Logout
Main	Add Links	Delete Links	Enable Checking	Contact WIC Admin
Edit Account	Display Account Log	Set Check Property	Set Check Time	Account Manual

Figure 5: User Menu

The screenshot shows a 'Set Check Schedule' window. At the top, there's a frequency selector with radio buttons for 'Every' intervals: 0, 5, 10, 20, and 30 minutes. The '30' option is selected. Below this is a grid for selecting hours. The grid has four rows representing 'All' time ranges and individual hours. The first row is 'All 0-5' with hours 0-5. The second row is 'All 6-11' with hours 6-11. The third row is 'All 12-17' with hours 12-17. The fourth row is 'All 18-23' with hours 18-23. In the 'All 12-17' row, the 'All' checkbox is checked. In the individual hour columns, checkboxes for 3, 7, 11, and 16 are checked. Below the grid is a 'Day' section with checkboxes for 'All Mon-Sun', Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, and Sunday. The 'All Mon-Sun' checkbox is checked. At the bottom of the window are two buttons: 'Clear Data' and 'Submit Data'.

Figure 6: Set Check Time

DISCUSSION

WIC operates by comparing the signature of the whole web page. Before altering the page, checking should be disabled and when finished, the operator should ensure that checking is re-enabled. WIC, at this stage, does not yet incorporate the ability to check specific sections of a web page. Some pages containing dynamic content such as date, time and banner changes cannot be verified by WIC due to this inability.

CONCLUSION

Changing a Web page by an attacker may result in serious unimaginable consequence. WIC is a tool to detect such unauthorized change as early as possible and can report and help to recover the attack automatically when the incident occurs.

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Chungu, A. S. University of Dar-es-Salaam, Tanzania. Revenue Diversification and Governance in Higher Education: Experiences of the University of Dar-es-Salaam.

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Abstract

The primary challenge facing colleges and universities in Africa and elsewhere is pressure to maintain quality and remain competitive in the face of resource constraints. Institutions are faced with limited public subsidies and tuition revenue. The small resources available are mismanaged. Consequently, institutions have entered into an aggressive pursuit of new revenue streams and governance of the scarce resources to achieve higher returns of outputs from the value inputs. Both public and private institutions have begun to see that diversifying their economic base is sound policy for all economic and political conditions (Breneman, 2002; Clark, 2002).

The paper examines new revenue creating efforts. These efforts fall into eight general domains (Hearn 2004). It also attempts to examine their application to the University of Dar es Salaam (UDSM). The examination starts in 1994 when UDSM adopted a Corporate Strategic Plan through the Institutional Transformation Programme. Furthermore, the paper examines governance issues to determine the extent to which UDSM has acquired resources to the best use. The impacts of governance strategies at UDSM are evident. UDSM has registered annual savings of more than 36% on campus cleaning and landscaping. In regard to catering services UDSM has registered annual savings of more than 106%.

INTRODUCTION

During the last 20 years African universities have come under increasing pressure to cope with the rapidly increasing student numbers. Meanwhile, the unit resource provided by government has shrunk drastically. Universities elsewhere especially, in the Commonwealth (Lund, 1999) and USA (Hearn, 2003) experienced the same fate. Many university leaders are caught in a quandary. They are hobbled up by government on issues of resource acquisition and mobilization.

Caught in the middle of a worldwide economic recession and competing demands, governments have reduced financial support for universities. A case in point is Tanzania which is experiencing rapid changes in the national economy as a result of globalization. The flow of resources to UDSM from the government has been reduced to a trickle. Over and above, UDSM faces a new challenge. UDSM relationship with the government has changed. For slightly over three decades UDSM was the sole higher-level manpower training institution. Currently, it has become one among many sharing with others public funds from the government. UDSM is receiving a smaller share than it used to in the past.

Reacting to the dramatic swings in the economy in the recent years and worrying that the present fiscal constraints may be long-lasting, universities and colleges have begun to see that diversifying their economic base and initiating cost-cutting measures is a sound undertaking for economic and political reasons (UDSM, 1994; Breneman, 2002; Clerk, 2002; Hearn, 2004).

This paper charts-out new revenue diversification domains as synthesized by Hearn (2004). It examines how the University of Dar es Salaam has addressed those domains within the Tanzanian context. The paper further scrutinizes governance issues with regard to income generation and cost-cutting measures employed at the University of Dar es Salaam. In discussing respective diversification revenue

streams/domains, the paper has also attempted to map out challenges in improving and enhancing financial diversification and governance at the University of Dar es Salaam.

NEW REVENUE STREAMS

Hearn (2004) identifies eight domains of revenue-seeking efforts. These are:

- (i) Instructional initiatives;
- (ii) Research and analysis initiatives;
- (iii) Pricing initiatives;
- (iv) Reforms in financial decision-making and management;
- (v) Human resource initiatives;
- (vi) Franchising, licensing, sponsorship, and partnering arrangements with third parties;
- (vii) Initiatives in auxiliary enterprises, facilities, and real estate;
- (viii) Development office initiatives;

Hearn (2004) points out that the above generic domains are not mutually exclusive. He surmises that it is sometimes difficult to separate cost savings from revenue generation. However, Hearn argues that the typologies provide a useful framework for considering revenue-generating activities. The generic domains are explained hereunder.

Instructional initiatives: in regard to this generic domain, institutions target new markets of learners, focusing on people seeking non degree, pre- and post baccalaureate certification as well as those seeking degrees. Often, instructional initiatives require significant new investment on the front end, signaling a need for careful examination of likely financial and non financial costs and returns. New offerings are delivered through for-profit subsidiaries or partnerships with corporations, governments, and other institutions. Ideally, such partnerships can leverage a university's name and existing course content with minimal expenditure of time, money, and credibility – all without endangering the exclusivity of the institution's own degrees.

Research and analysis initiatives: many universities reorganize their research and analysis capabilities in pursuit of revenues. Many too, have developed technology-transfer offices to improve chance for such financial returns from ideas developed on campus. Among the other approaches adopted by various institutions are creating on-campus incubator units to nurture start-up firms, entering "e-commerce" (the selling of goods and services electronically), and developing fee-for-service offerings. Overall, the results of these new efforts are usually mixed.

Pricing initiatives: a growing number of institutions provide discounts on tuition for students with certain desired characteristics to generate a students body providing more revenue overall. In addition, institutions are increasingly "unbundling" their fees into separate areas and allowing students to choose which services to purchase. The user-fee approach has made pricing and costing more transparent to consumers and, in many cases, has allowed institutions to increase their revenues. Many institutions are also differentiating their standard tuition in various ways, including, by a student's major area, course load, degree level, and program year; by a course's home department; by class size or facility usage; and by an instructor's degree level and rank.

Reforms in financial decision-making and management: institutions have pursued improved returns on their liquid assets through participating in non-traditional investments (e.g. options markets) as well as large investment pools with lower administrative costs. To create faculty-level incentives for the pursuit of new revenues (and the reduction of costs), some institutions have implemented decentralized budgeting systems, which treat each organizational unit as a quasi-independent financial entity responsible for its own revenues and losses.

Human-resource initiatives: some institutions are deploying human resources in new ways to improve revenues. For example, some have refined compensation and promotion processes to provide more explicit incentives for faculty revenue-generating activities. Institutions can also tighten rules and regulations concerning individual consulting by faculty.

Franchising, licensing, sponsorship, and partnering arrangements with third parties: collaboration in institutional activities with externally based partners can provide new revenues. Institutions often outsource bookstore and dining facilities, and increasingly universities outsource other operations as well. In addition, institutions are allowing other parties to use their resources, such as the expertise of faculty members or the athletic logo, in exchange for additional revenue.

Initiatives in auxiliary enterprises, facilities, and real estate: in some but assuredly not all cases, revenues generated by auxiliary units such as hospitals, athletics departments, bookstores, dining facilities, and hotels exceed costs. Classrooms, residence halls, recreational areas, and undeveloped land are assets that can ideally provide additional revenue for institutions. In recent years, this arena has been a hotbed of new ideas. For example, many campuses have initiated debit-card programs that are convenient for students, attractive to merchants, and lucrative for institutions.

Development-office initiatives: most institutions in the United States are aggressively expanding efforts to bring in donations from alumni, private individuals, foundations, and charitable organizations. Efforts in the public institutions especially, have grown in recent years, as have efforts to attract funding from other nations.

In pursuit of new revenue, the generation of new net returns is the ultimate goal of any revenue-diversification effort, not simply the generation of new revenue. Potential returns can be of non-financial as well as financial and can come in the short or long term.

ASSESSMENT OF NEW REVENUE STREAMS AT THE UNIVERSITY OF DAR ES SALAAM

UDSM attempts at new revenue-seeking efforts are manifested in the Corporate Strategic Plan approved by Council in 1994. The Plan is implemented through the Institutional Transformation Programme (ITP) and coordinated since April 2002 by the Directorate of Planning and Development (DPD). Before then, coordination was done by the Programme Management Unit, the precursor to the DPD.

The Institutional Transformation Programme calls for alternative sources of funding for UDSM apart from its traditional sources like government subvention and tuition fees. It challenges the UDSM to review its mission, objectives as well as its legal and social status in order to address the financial shortfall in carrying-out her academic mission (UDSM, 1994). In the efforts to implement the UDSM Institutional Transformation Programme, a study on cost-cutting and income generation measures was initiated in April 1994. The study was carried out by a six-member committee, which submitted its first and final report in 1995 and June 1998 respectively (UDSM, 1995). Implementation of some of the recommendations of the committee on cost-cutting and income generation measures begun in 1995.

Following on the footsteps of the study on cost cutting and income generation, the University Council organized a brainstorming session in October 1997 to discuss ways of additional sources of funding to UDSM. One of the major recommendations was a call for the establishment of a think tank unit to liaise

with different departments with respect to follow-up and implementation of the findings in the report on cost-cutting and income generation measures.

As a result of that call the office of Income Generation Unit (IGU) was established in February 1998 to coordinate income generation and cost cutting measures. Since June 2004 IGU has been transformed into a Directorate of Investments and Resource Mobilization (DIRM). Let us at this juncture survey the generic revenue domains and their application at UDSM.

Instructional Initiatives

The Institutional Transformation Programme awakened UDSM to the challenges ahead. UDSM realized that revenues from government sponsored core academic programmes remained constant or grew insignificantly. This brought threats to UDSM with respect to the financial resilience of the core programming. It also threatened institutional confidence. Furthermore, it became evident that new providers, new markets and new technologies are changing the grounds on which institutions make academic decisions. The entry of the private universities in higher education in Tanzania changed the market players in the equation of academic providers in the country. UDSM responded to external threats aggressively by targeting new markets. A case in point are, admitting private students in the regular programmes, initiating evening programmes for corporate learners and professional enhancement learners and pre-university learners. Other programmes in the instructional arena initiatives include:

- (a) Establishment of a Centre for Continuing Education (CCE) in November 2001. The centre coordinates short courses and non-degree courses.
- (b) Establishment of UDSM Entrepreneurship Centre (UDEC) in 2001. The centre provides and coordinates non-degree business courses and facilitates entrepreneurial courses in various disciplines.
- (c) Establishment of the African Virtual University-Learning Centre (AVU-LC) in 2002. The centre caters for candidates who are unable to participate in residential training and those who need an international flavour of a degree award. As from 2003 the UDSM AVU-LC is the Lead Partner University (LPU) within the African Virtual University (AVU) network for the award of the Computer Science degree in collaboration with RMIT of Australia. In this arrangement, UDSM will by 2005 have the capacity to up-link programmes to the Universities in the AVU network.
- (d) Establishment of evening degree programmes in the Department of Mathematics (starting from 1999), Faculty of Commerce and Management (starting from 2001) for undergraduate degrees (e.g. BBA) as well as Executive MBA, and in the prospective College of Engineering and Technology (pCET) for postgraduate diploma and master's degree (starting from 2002).
- (e) Plans for establishment of Faculty of Informatics and Virtual Education in 2004/2005 to cater for the rich market in Information and Communication Technology (ICT).
- (f) The University Computing Centre (UCC) Limited since 1995 has been providing ICT courses in-house and outside the University community. To-date UCC Ltd. has established branches in Dar-es-Salaam city, Arusha, Dodoma and Mwanza and there are plans to open another one in Mbeya.

There are faculties that are yet to take-up the opportune initiatives like creation of short courses for CCE delivery, evening degree courses/programmes and development of teaching-ware for ICT distance learning delivery. Deliberate policies and incentives would be required in this direction.

Research and Analysis Initiatives

This is an important area addressing one of the outputs of the core terms of reference of a university. At UDSM, the following have been done:

- (a) In 1999, UDSM adopted a university wide research policy that require UDSM staff doing research to pay an institutional fee of 8% of the gross research grant to cover administrative costs and infrastructure use. Institutional fees that come under frame agreement such as SIDA/SAREC,

etc., have always adhered to the 8% payment. The challenge still remains to individual research grants to follow suit.

- (b) In April 2004 UDSM management appointed a team of experts from within its academic members of staff to study and examine the possibilities of having a technology transfer office to oversee the output of research and trade. The University has lost about three known research outputs to Kenya and Netherlands universities, which were patented in those countries for lack of clear policy on treatment of research outputs. This is an area of challenge for UDSM to address. More challenges include, issues of incubators and spin-off concepts. An attempt in this direction has been made by pCET in 2002. In that year pCET in collaboration with Gatsby Trust (Tanzania) Limited developed an incubator project for small and medium size enterprises (SMEs) in Kibaha (Cost region), Lushoto (Tanga region), Morogoro and Zanzibar. In April 2004, the Carnegie Corporation of New York has also supported certain aspects of pCET facilitation mobility project.

Pricing Initiatives

The University of Dar es Salaam is a public funded University. The bulk of overhead costs like staff emoluments are fully paid for by the government. Any additional student within the acceptable staff-student ratio entails and involves additional costs associated with direct student costs in teaching, laboratory and practical fieldwork. At UDSM, despite the increase in numbers the overhead costs remained the same. This made it possible for the University to lower its student fees to levels that many Tanzanian can afford. In 2003/2004, this strategy attracted about 1,200/= private paying students. However, there is a fallback in payment of fees. It is in the same year that government sponsorship for the first year students was reduced from 3,500 to 2,500 students. The fees were structured and priced according to the programmes to be offered. The number of first year government sponsored students has remained the same for 2004/2005. One expects the number to remain the same 2005/2006.

The Higher Education Student's Loans Board Act, 2004, provides for any Tanzanian student to enroll in any university of their choice without concern of whether they study in a public or private University (URT, 2004). However, with the Student's Loans Board Act in place more efforts by UDSM will be required in respect to:

- (a) Maintain the steam of the on-going exercise of determination of student unit costs to be done jointly with the Ministry of Science, Technology and Higher Education (MSTHE). Different programmes need to be spearheaded and accomplished so as to provide more financial flexibility and autonomy to universities.
- (b) Intensify marketing of UDSM programmes and strategically set flexible pricing mechanisms by course load, programme year, course's home department, class size or facility usage, and by an instructor's degree level and rank. All these would depend on market research responses.

Reforms in Financial Decision-making and Management

In line with the ITP a number of financial and management reforms have been undertaken by UDSM to improve delivery of services in teaching, research and services to the Tanzanian society. These include:

- (a) Implementation of the vision of new organizational structures that are possible within the current University of Dar es Salaam Act No. 12, 1970. The following structures have been created and established:
- University Consultancy Bureau (UCB), June 1993;
 - University College of Lands and Architectural Studies (UCLAS), July 1996;
 - Directorate of Research and Publication (DRP), May 1999;
 - UDSM Entrepreneurship Centre (UDEC), November 2001;
 - Centre for Continuing Education (CCE), November 2001;
 - Directorate of Planning and Development (DPD), April 2002;

- Directorate of Undergraduate Studies (DUS), December 2003;
 - Directorate of Student Services (DSS), January 2004;
 - Directorate of Investments and Resource Mobilization (DIRM), June 2004;
- (b) Enhancement of strategic planning culture which is monitored bi-annually.
- (c) Clustering of Faculties, Institutes and Centres into Campus Colleges. Cases in point are the prospective College of Engineering and Technology (pCET) in December 2001 and the Muhimbili University College of Health Sciences (MUCHs) in 2003/2004.
- (d) Establishment of zonal and regional matriculation centres in Mwanza, Dodoma, Arusha, Mbeya and Zanzibar.
- (e) Establishment of the UDSM level external finance administration unit (EFAU), computerization of financial management information system (FMIS) and adopting the SCALA system to cater for all financial information requirements. Also, attainment of a revised and improved University Financial Regulations handbook.
- (f) Development and implementation of the Academic Register Information System (ARIS). ARIS has successfully been used by pCET in students' fees and accommodation rent collections.
- (g) Diversification of sources of funds by establishing the Directorate of Investments and Resource Mobilization (DIRM).
- (h) Rationalization of services and staff retrenchment. This has resulted in the reduction of delivery of municipal and support services to the University of Dar es Salaam as well as providing some revenues in other ventures.

Rationalization of Services

Some of the rationalized services like the students' cafeterias (3 cafeterias with about each 320 sitting capacity) and one staff canteen have realized net earnings of Tshs. 110.4 million per year. This was after retrenching staff in June 2000. In the past the cafeterias and canteen were run by UDSM. The cafeterias and canteen required an average annual subsidy of Tshs. 104.5 million per year, which increasingly became very difficult to control and was prone to cheating. The private operators who took over the cafeterias in September 2000 pay for all costs of service provision including utilities. Moreover, they also pay rental lease fees of Tshs 5.9 million to the UDSM per year. Therefore, the total revenue available to UDSM after rationalization of catering services in real terms starting September 2000 to September 2002 is on average about Tshs. 110.4 million per year. This earns financial savings of 106%.

Earnings from private catering services at Mabibo, Kijitonyama and Ubungo hotels are not included in the above equation. Neither are the earnings from the Kiswahili Building eating place. These services came into effect after the rationalization exercise as a result of expanded student enrolment. These facilities have earned UDSM Tshs. 11.9 million per year.

In the process of rationalization, Cafeteria Number 3 (commonly known as Yombo Cafeteria) was found to be underutilized and was closed. Instead, the building has been converted into three lecture rooms and one computer laboratory. The new facility currently accommodates 608 and 100 students and computers respectively. The complex has also provided an additional 17 staff offices.

Other areas of rationalization include, an insurance agency created in August 1998 and a central pool transport system in January 2000. The former was established as a means of cost cutting but also to provide confidence and insurance to cover UDSM and its communities' properties. It was also set up to provide net income earnings to UDSM. The transport pool was established to cater for the UDSM activities on a hire basis at cost price. The pool started with 3 four-wheel drive vehicles. Currently, the pool boasts with 11 four-wheel drive vehicles. Another cost-cutting exercise was the establishment of the University Students Accommodation Bureau (USAB) in August 2000 in order to meet accommodation challenges. USAB operates as an agency of the UDSM.

The Research Flats and the Photographic Unit have been refurbished and have been brought back to life as income generation entities. The total income generated by the units in DIRM for past six years is Tshs. 0.5037 billion per year. Altogether, the units have performed admirably as demonstrated in Figure 1. Revenue in the Bursar's office includes tuition fees, lease fees, and miscellaneous incomes.

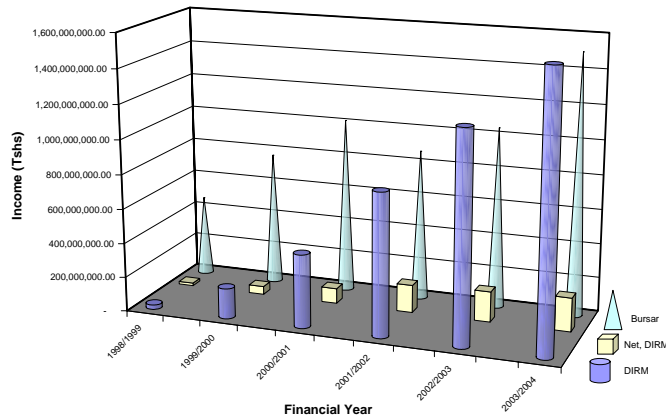


Figure 1: Revenue to DIRM and Bursar's offices from 1998/99 to 2003/04 Period.

Retrenchment of Staff

The exercise of retrenching staff brought savings in the form of reduced costs to UDSM in terms of staff welfare like annual leave, medical bills and overtime charges. In the years 1994, 1996, 2000 and 2002, UDSM retrenched 25, 604, 343 and 12 staff respectively in municipal services such as estates department, cafeteria and canteen, halls of students' residence, cleaning, landscaping and messenger services. Except for the management of student halls, municipal services had been contracted out to third party operators. Management of students halls is entrusted to a UDSM agency namely, UDSM Student Accommodation Bureau. The Bureau has financial autonomy subject to UDSM financial regulations.

Substantial financial savings have been made in cleaning and landscaping services. The quality of the services has improved too. For 2000/2001, 2001/2002 and 2002/2003 cleaning services for students' halls and academic buildings have registered financial savings of 87 million, 93 million and 146 Tshs. million respectively. Cleaning services are provided through a competitive tendering system that regulates the market prices naturally. There has not been any significant increase in the pricing of the services provided by the operators. Records show that in 2000/2001 the total sum was Tshs. 191.9 million, 2001/2002 it was Tshs. 185.9 million, and in 2002/2003 it was Tshs. 195.2 million. The financial saving in this respect is 36.3%. This is demonstrated in Figure 2.

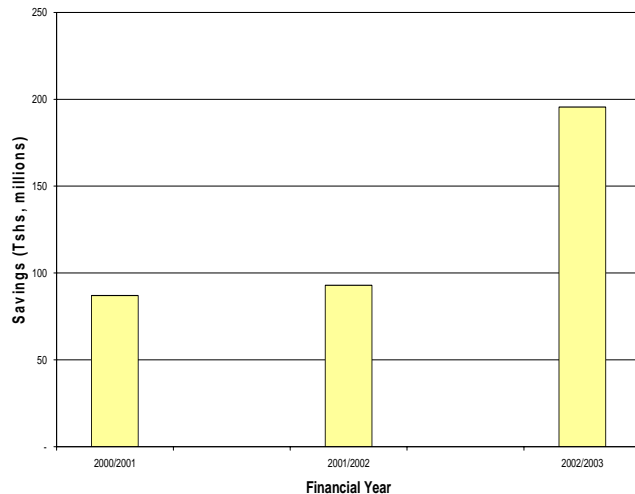


Figure 2: Financial Saving in Cleaning and Landscaping Services from 2000/01 to 2002/03

Human Resource Initiatives

The University Consultancy Bureau (UCB) has been employing human resource to provide consulting activities to make revenue. The UCB has developed a consultancy policy to the effect that registered consultancy work would be counted in considering a faculty member for promotion. The individual consultant earns 75% of the net consultancy fee after deductions of direct cost. This is only true for UDSM Main Campus faculty. In regard to UCLAS and the Institute of Resource Assessment the percentage for the consultancy is 60%. In other words, UDSM receives revenues from consultancy ranging from 25% to 40% of the consultancy fee. It is a moot point whether this is adequate to cover overhead costs.

Plans are underway to refine existing compensation and promotion procedures. This would entail and involve provision of incentive to faculty members for revenue generating activities including securing of research funds. There is potential for incremental change over the longer term in salary and promotion systems. After all, as pointed by Hearn (1999) research and publication were far less valued in university salary and promotion systems before the 1970s than they are now.

Franchising, Licensing, Sponsorship, and Partnering Arrangements with Third parties

Partnering arrangements featured prominently during the East Africa Inter-Universities sports and games held in December 2003 at the UDSM. These featured in catering, transport, play grounds, shops and accommodation. Companies like Wazo Portland Cement, Coca-Cola, Celtel and Vodacom sponsored certain events.

In the area of licensing with third parties an attempt has made to license some of the technologies developed by the Institute of Production Innovation (IPI). Currently, the IPI is known as Technology Development and Transfer Centre (TDTC).

The technology in question is the amalgam retort technology used in processing gold for small miners. The technology was licensed in 1996 to a Dar es Salaam based company. Also, in 1997 the IPI licensed

palm oil processing technology to the Small Industries Development Organization (SIDO) in Mbeya Region. Income from both organizations has not been forthcoming for lack of national framework enforcement mechanisms on intellectual property rights.

Likewise, in 1995 the Faculty of Engineering acquired two Professorial Research Chairs. One is from the Tanzania Electrical Company Limited (TANESCO) and Tanzania Petroleum Development Company (TPDC) for energy and environment chair. Also, the Faculty secured a telecommunications chair with the Tanzania Telecommunication Company Limited (TTCL). UDSM is yet to attempt franchising with third parties.

Initiatives in Auxiliary Enterprises, Facilities, and Real Estates

Initiatives in auxiliary enterprises

On this score, UDSM has established two private companies. UDSM is currently working on a future campus smart card enterprise in partnership with third party investors. Hereunder are some illustrations in this category.

- In July 1996, the Dar es Salaam University Press (DUP) Limited was established to carry out activities in publishing, printing and bookshop.
- In January 2001, UDSM established the University Computing Centre (UCC) Limited. UCC Ltd. is in-charge of delivery of information and communication technology (ICT) within UDSM and the public. The UCC Ltd. is a reputable centre of excellence in Sub-Sahara Africa with top-notch expertise in network management, software development, training in ICT courses, computer maintenance and consultancy.
- Introduction of 'chip-based' multi-purpose smart card for students and staff. Similar attempts have successfully been done by a number of reputable universities like Florida State University and Thames Valley University (Luhanga and Mbvette, 2002). The smart city hardware and software for basic smart card production have already been procured. Implementation of the smart campus card came into effect in 2002 with students' identity cards. Efforts are underway to cover staff and other business communities in the country.

Initiatives in best use of facilities

UDSM has a number of facilities including, sports play ground, swimming pool, hospital, cafeterias, canteens, classrooms, unoccupied or under-utilized buildings, halls of residence and hostels, filling station, and the Silversand Hotel. The motto has been maximum utilization of the facilities by leasing same to third party users in short or long term depending on availability. For example, halls of residence, hostels, theatres and classrooms are available for short-term lease during the long vacation from June to September.

Certain services are somewhat sensitive. Medical care is a case in point. Staff and students usually enjoy free medical care. The challenge is really how to improve the UDSM Health Centre (UHC) services so that it can attract other potential clients. Nicklin (1996) and TRS Rulling (2003) surmise that cost increase, insurance limitations and growing corporate competition have limited the success of university hospitals. Because of this a number of institutions have merged their hospitals with other providers. UDSM could look into this possibility in order to improve the UHC services. Meanwhile, the Miscellaneous Amendment of the National Health Fund Act, 2002 calls for cost sharing between employers and employees. This is a major policy shift at national level. For purposes of this discussion it is also a major challenge to UDSM.

Initiatives in real estates

Third party investment in real estate in UDSM lands has been quite successful. However, more efforts are required to achieve the intended vision of UDSM in inviting interested investors in all lands earmarked for investments. Issues of investment addressed so far include:

- ❖ In July 1997, the University adopted a land use master plan that demarcated lands for commercial use by third party investors. The land use policy was further reviewed in March 2001 in order to safeguard UDSM lands but at same time provide a conducive investment climate. The land that is earmarked for investment and safeguarded is along Sam Nujoma road. It is only 17.5% (195 acres) of UDSM land.
- ❖ In 1999, the University entered into a contract with Hill Park Limited to rehabilitate and upgrade the kiosk shop formerly managed by the Faculty of Commerce and Management into a supermarket. The contract also included upgrading the staff canteen into a restaurant and bar.
- ❖ In May 2001, UDSM convened an International Investment Forum at the Sheraton Hotel (now Royal Palm Hotel) in Dar es Salaam to inform the national and international community of the investment potential and prospects that exist at the UDSM.
- ❖ In May 2003, UDSM signed a Memorandum of Understanding (MoU) with a Botswana based investor to develop 40 hectares land for a shopping mall, conference, hotel, office park, residential apartments, and a game park costing US Dollars 82.5 million. Construction is expected to start in October, 2004.
- ❖ In July 2003, UDSM signed a Memorandum of Understanding with La Casa Investment Limited based in Tanzania for the development of students' hostel costing US Dollars 10 million.
- ❖ GAPCO (T) Limited has shown interest to develop a modern school to be co-managed with UDSM Faculty of Education. It is estimated to cost US Dollar 13 million.

Development Office Initiatives

UDSM has since 1993 established a PMU office, which in April 2002 was transformed into a Directorate of Planning and Development (DPD). DPD is responsible for planning and coordinating donor funded programmes, and development initiatives. Several donor countries namely, Sweden, Norway and Finland and donor organizations like Carnegie Corporation of New York, Rockefeller Foundation and DFID have been working with UDSM.

In accordance with the University of Dar es Salaam Act, 1970 a Convocation Office was established to coordinate alumni activities. UDSM has buoyant alumni which unfortunately has not been forthcoming in contributing to their Alma Mater. UDSM therefore, need to work hard to change the mindset of own alumni and to build a self-sustaining development effort.

CONCLUSION

It should be noted that each college or university faces a distinctive context in shaping its choices. There is not one best approach for institutions seeking new revenue sources. Local condition must be central to institutional decision-making (including mission, students, faculty members and staff, curriculum, as well as the immediate economic, political, technological, and social situations facing the institution). Based on the experience of the UDSM, any new revenue-seeking initiative should meet the criteria of the institutional mission, cultural, strategic substantive quality, financial prospects, market understanding, risk tolerance and organizational sustainability. The importance of individuals should not be overlooked in making investment decisions. Success in revenue seeking depends in talented and ambitious people. Furthermore, UDSM experience demonstrates the importance of senior management to set up appropriate financial, professional, and personal incentive to stimulate energy and commitment of faculty and staff. Guidance and leadership of senior management is crucial in entrepreneurial initiative. Senior management must be responsive to ethical legal and technological changes. Government investment in higher education is supremely important. It is altogether impossible for an institution of higher learning to

function through own generated revenue. The cherished status of UDSM as a public institution of higher learning will continue to depend on government funding.

Unlike businesses, universities cannot acquire and drop product lines with financial returns in mind. Unreflective movement towards diversified revenue streams can corrode commitments to established and valued institutions' cultures, identities, and missions. The offering of degrees online, for example, involves the "brand" of the institution in a very fundamental way. In those circumstances institutional leaders should ask: "Is this effort truly core to who we are and who we want to be? Is this a legacy I wish to leave as a leader?" At its worst, the pursuit of new revenues can be mindless and dispiriting. It is essential that institutional leaders help fashion a path that coheres and motivates. Ideas for new revenue streams may be promising in a business sense but threatening in a cultural and organizational sense and perhaps a disservice to the public. The best choice may be to walk away. When promising ideas are also inspired and inspiring, however, wisdom may lie in moving forward.

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Cross, J. M. Edith Cowan University, Australia. Sino-Australian Collaboration in Higher Education: New Directions.

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Abstract: China is undergoing a major transformation following such events as entry to the WTO and Olympic Games selection for 2008. This is not only having an impact on the physical landscape and economic growth of the country but also is leading to reforms in many areas including education. Recently new guidelines for overseas educational institutions working within China have been introduced which support the collaboration of universities and set a framework for quality and effective governance. This paper will outline new opportunities and directions for overseas universities working with Chinese universities on international and commercial projects. In particular the experience of Edith Cowan University in developing Sino-Australian Higher Education Collaboration projects will be outlined.

Keywords: China, Higher Education Reform, Collaboration

INTRODUCTION

Demand for an international education from an English speaking country has always been strong in China. Increasing numbers of students have traveled overseas to countries in Europe, North America and Australia to undertake their undergraduate and graduate study. While some of these students have been funded by government scholarships the vast majority are full fee paying students using personal or loan funds for support. In the main, these students were recruited via education agents and subagents working with overseas universities. This is now changing as Chinese universities identify opportunities for articulation programs with overseas universities and delivery of joint international degrees within China.

Previously, foreign university collaboration with Chinese universities has focused largely on mutual research and cultural exchange arrangements on a not for profit basis. More recently some of the universities identified the opportunity to develop foundation and articulation programs with overseas universities as well as offering overseas degrees within China. This change has also received support from provincial and central Education ministries.

Like many other Australian universities Edith Cowan University has developed strong links with a number of key universities in China for the delivery of programs in China and international articulation programs from students wishing to study part of their degree at ECU in Australia or with partner institutions in other countries. The opportunities, challenges and benefits will be outlined based on the author's experience in establishing and managing such programs.

CHINESE ECONOMIC REFORM

It is impossible to consider higher education reform in China without reflecting on the comprehensive economic reform that is taking place since 1979 as China moves towards a market economy with socialist characteristics. The dramatic reorientation has led to reforms in many areas of society including education. In 1979 Deng Xiaoping positioned China for rising prosperity and stability by opening the economy to global influences and by adopting the four modernisations for Chinese future: Agriculture,

Industry, Defence and Science and Technology. Much has been written on this reform. Wireman (2003) in a speech summarised the impact of this reform by providing the following examples:

The opening of the five Free Economic Zones along the East Coast;

The market economics resulting in 20 years of uninterrupted seven to ten percent annual growth;

Rising income stimulating more purchasing power for consumer goods;

Increased tax revenues providing over US\$400 Billion reserves by 2003;

Ranked second in the world for Foreign Direct Investments with US\$800 billion either in current or future commitments;

Domestic and Foreign tourism growing rapidly to be number five in the world to attract foreign tourists;

Smooth transition of sovereignty over Hong Kong in 1997 and Macao in 1999;

Entry to the World Trade Organisation in December 2001 opening export and import markets to enhance growth;

Selection to host the 2008 Olympics in Beijing and the 2010 World Expo in Shanghai will bring new opportunities for economic and cultural growth and opportunity to showcase the progress made;

Over 300 million people have moved from poverty to middle income purchasing power.

The aim is to quadruple China's GDP by the year 2020 and to achieve a GDP of US\$440 billion in ten years, a level equal to Japan.

In addition to these accomplishments it is noted that China now leads the world in the number of mobile phones with 150 million and over 60 million use the internet. Over one million private cars have been sold in China demonstrating the increased purchasing power of Chinese particularly on the eastern coast. Unfortunately not all are benefiting from the economic success and there is a need to focus on the literacy, educational and income levels of the 800 million Chinese in the west. This is a major focus of government policy which is now developing strategies to deal with this challenge. For example nine year compulsory education has been the focus of the Ninth and Tenth Five year Plan for Education in an attempt to eliminate illiteracy among people under 45 and to improve the overall educational level and life quality for Chinese people.

The above economic and social success could not have been possible without significant reform of the education system at primary, secondary and higher education levels. It is against this background of economic system reform that the reconstruction of Chinese Higher Education has been staged.

CHINESE HIGHER EDUCATION REFORM

Quang Lianqing (1996), Director of the Higher Education Institute of China and ex Vice President Fudan University provided an excellent overview of the China's higher education under reform which forms the basis of much of this section. In addition a good source of the developments in higher education in China can be found in the book by Ruth Hayhoe (1999) which focuses on the higher education in for the 100 years from 1895 to 1995. More recent reform efforts in higher education can be found in a variety of

articles including Min Weifang (2001) and recent press release from the Chinese Education Minister Zhou Ji (August 2004) on current status of reform in higher education and future directions.

Anyone visiting universities in China such as Hunan University would realise that education has been an endeavour for several thousand years but the focus was on ancient Chinese and Classics. Western style higher education in China did not occur until the end of the nineteenth century with the establishment of Tianjin, Jiaotong and Peking Universities in the 1890s. China rapidly developed a system of colleges and universities in the twentieth century many of them established by Europeans and American missionaries following models from the west. In 1949 when the People's Republic of China was founded there were only 117 000 college students and 207 institutions of higher education in China with over 40% located in the 6 largest cities.

After 1949 all the universities were nationalised and in 1952 the institutions were reorganised along Soviet/European lines with focus on specialist training to meet the needs of a developing society. By 1993 there were 1075 universities and colleges in the nation with enrolments of over 2 million. The many institutions were administered by a variety of governments at local, provincial and central level resulting in confusion and overlapping responsibilities. In addition with central government administration and control there was little opportunity for the universities and colleges to be innovative and improve the quality of education delivery to meet the changing needs of society.

With the economic reforms agenda outlined by Premier Deng Xiaoping in 1979 came the need for the education system to reform to meet the new challenges. Strategies for reform were outlined in the five year Education Plans. One of the major reforms undertaken was to expand the higher education system to provide for greater opportunity for students to undertake professional training to meet the needs of the market economy. From 1990 to 2000 the range and scope of professional training at universities was enhanced and at the same time the number of graduating students increased substantially particularly at higher degree level. The Ninth Five year plan from 1996-2000 emphasised the need to strengthen its basic education, boost higher education, improve the quality of education and continue education reform. In particular the State Education Commission urged colleges and universities to share resources, "Project 211" was established which provided US\$1.2 billion to prepare the key 100 higher education institutions for the twenty first century, amalgamation of institutions was initiated and student fees were introduced (CBIN(1996)). By 2000 there were more than 12 million students in 1 200 universities and almost 700 adult education institutions which matched the projections given in the education plans. In addition 612 institutions have been merged into 250 larger institutions. The change from elite to mass education in such short time reflects the Chinese government's belief in the importance of education to drive continued economic growth.

The joining of the WTO community with its vibrant economy and appeal for foreign investment reinforced the need for professional training of people who understand international economics, who speak foreign languages and who are sophisticated about business and political practices in other parts of the world. The Tenth Five Year Education Plan covering the period 2001-2005 continues the focus of the previous plan with greater emphasis on internationalisation of education and foreign investment in education within China. In August 2004 at an Education Forum for Asia 2004 Education Minister Zhou Ji confirmed that China had witnessed great progress after more than 20 years of development. In particular he noted the following achievements:

Enforcement of the nine-year compulsory education nationwide ;

Approximately 92% had received nine-year education by 2003 and illiterate rate of adults has reduced to less than 5%;

China's primary and secondary schools now have 201 million students and the rate of China's universal education was in a leading position among developing countries;

The annual enrolment of new students entering higher education institutions increased to more than 4.2 million in 2004 with more than 20 million students on campus;

China has signed agreements on mutual recognition of higher education qualifications recognition with UK, Germany, France, Australia and New Zealand since 2002;

Despite the significant increase in numbers studying in higher education institutions in China the demand still exceeds supply. The Minister indicated that more effort will be made to improve rural education, train teachers for vocational education, support private run schools and enhance international educational cooperation and exchanges in the future.

A significant number of initiatives within and external to the higher education institutions are:

1. Changing the funding pattern for higher institutions to include alternate funding sources such as student tuition fees, non government organisation. Foreigners and overseas Chinese;
2. Reforming the administration of higher education to provide for more autonomy;
3. Raising the efficiency of institutions;
4. Establishing private higher education institutions within guidelines established by government;
5. Reforming the internal administration of higher education institutions;
6. Reforming the enrolment system;
7. Reforming the system of job assignment for graduates, and
8. Providing opportunities for entrepreneurial activity including international linkages with overseas higher education institutions for benefit of students, staff and the institutions.

It is the last area of international collaboration that is the focus of this paper however the overall context of reform in the broader economy and higher education sector needs to be taken into account.

NEW OPPORTUNITIES FOR COLLABORATION IN HIGHER EDUCATION

Prior to the reforms outlined above foreign university collaboration with Chinese universities was restricted to cultural exchange of students and staff on a non profit basis. These links are useful in providing opportunity for research collaboration, bilateral government exchange and student scholarships. These programs have been particularly effective in particular for top US and UK based universities to attract academically able graduate students and staff for study in their country. This continues today but numbers have been relatively small.

However during this time most foreign universities from western based countries relied on student recruitment agents to recruit private Chinese students to study at their university. While there were strict controls by Chinese government on the licensing of agents there have always been problems with the proliferation of subagents, sale of licences and the practice of charging students for processing of visas. In addition there have been difficulties with fraudulent documents and difficulty in determine the suitability of students for study in an overseas country.

The alternative was for universities to deliver their programs within China usually in conjunction with a private college. While this practice has continued there are a number of concerns expressed by Chinese education authorities at provincial and Central level with the proliferation of programs with little or no

clear quality assurance. In addition, universities from outside China have expressed concern at the difficulties in transferring money from China as well as the risk in relying on agents and subagents for recruitment of students and involvement with their offshore activities in China. In many cases this has led to reputation problems and financial disaster for the foreign university where agents or partner in China have provided programs of questionable quality or failed to transfer funds to the university in acceptable time frames.

With the recent reforms, the associated government guidelines and the increasing interest by Chinese government universities to supplement their income, there have been an increasing number of new opportunities and directions for bilateral university collaboration that provide alternative opportunities for foreign universities.

With limited funding for higher education from central government, there is real enthusiasm for academic collaboration between Chinese and foreign universities. The hope is that the new programs and pathways can enhance quality, provide a wider range of academic and professional programs, raise standards to international level and ease the demand being placed on the university sector. There are now many programs that have been established with institutions in China, with Australian universities making up 25% of the total according to recent Chinese Ministry of Education data. Due to the rapid increase in approved programs, the Chinese Ministry of Education has established guidelines for the approval and delivery of a range of higher education programs in China to ensure quality and to protect the student's interests. As recently as July, 2004, a new set of guidelines have been released which ensure the controlled expansion program that are delivered in China by Foreign universities or in association with Chinese higher education institutions.

The programs involving foreign higher education institutions vary greatly with new opportunities being initiated by either the local or foreign higher education institution. It is the authors' experience that Chinese universities which are part of the "Project 211" are becoming more proactive in identifying programs that fit their needs rather than reacting to proposals from the foreign universities.

A range of new collaboration programs that Edith Cowan has been involved in are provided below.

Articulation Programs for Quota and Non Quota students

Articulation pathways have become increasingly popular in the last few years. Such programs involve the Foreign university recognising for advanced standing the study undertaken in China with a higher education provider. Such programs at undergraduate level are commonly called "1+3", "2+2" etc indicating the number of post secondary years studied in China before going overseas. The programs have become attractive to Higher Education Institutions in China for non quota students who fail to meet the entry to a top Chinese university or who wish to study overseas. The students are usually selected on their academic ability, English levels and financial ability to fund their overseas study.

Edith Cowan University has established articulation programs with primarily "211" universities such as Nanjing University which are ranked highly in China and have a reputation for quality. The students undertake the same syllabus as the quota students for their study in China and are taught by the same Chinese University staff. In addition, the students are provided with additional English. Edith Cowan University assists with the promotion of the program and recruitment in conjunction with an approved recruitment agent. The agent works closely with the Chinese University in providing the necessary support for the students and frequently is involved in recruitment as well as providing assistance to students applying for visas. Once the students have obtained their visa and have left for offshore, the agent continues to provide support for the student and parents. In many cases, the initial link between the universities has been facilitated by the contacts of the agent in both the Chinese and Foreign university.

From observation it appears that the best model for such articulation arrangements is for the two universities to have direct agreement in terms of the academic program and for each of the universities to have an agreement with a good quality licensed Chinese agent who can provide the necessary support to both the universities and the students. Frequently the Chinese university concerned provides an office for the staff of the agent on campus who provide administrative and student support. In order to be successful there is a need for the universities concerned and the agent to have developed a strong relationship of trust and mutual support for the program.

The benefits of such programs are obvious as they provide an opportunity for students in China to save money on tuition fees, to improve their English and to have a link with both a Chinese and overseas university. The benefit to the Foreign University is that the quality of students can be monitored over the time of their study in China and planning can be undertaken in preparation for the anticipated flow of students. The Chinese university benefits through additional income revenue and the opportunity to develop strong international links with overseas universities with benefits in other areas such as teaching and research.

Australian universities have been quick to identify the advantages of such arrangements and most are involved in a variety of such programs. The 1+3 model which provides a foundation course for entry to university study in Australia is particularly popular with many programs being offered in China by both private and government institutions. This includes institutions from outside China delivering such programs with the approval of the Chinese authorities.

The most popular articulation programs are focussed on Business and IT but there are now more programs being established in other disciplines including the sciences, engineering and communication.

The Ministry of Education in China is aware of the development of these programs and sees the need to monitor the approval and quality of such programs in order to protect the students who need assurance that their studies in China will provide a pathway to degree overseas. As a result the Ministry of Education has provided "Interim Provisions for Chinese-Foreign Cooperation in Running Schools" which covers not only the delivery of Foreign programs in China but more broadly the promotion of education in China and collaboration in Education. CERNET (2004). The Chinese universities are aware of the regulations and particularly the top "211" universities are very careful to make sure they have the necessary approvals at both the provincial and central government level to deliver such programs.

While the discussion above has focussed on undergraduate articulation programs there is now interest in similar arrangements for postgraduate study where part of the coursework Master is undertaken at a Chinese university. In addition there is growing interest by Chinese universities to deliver programs in China for three year diploma students who wish to prepare for entry to offshore Master programs.

Another interesting trend is for top ranked universities, particularly "211" universities, to allow their quota students to study overseas for one or more years on a fee paying basis. While numbers of students are likely not to be as great as the non quota programs, this form of articulation provides an opportunity for top quality students to study abroad and in some cases obtain two degrees in same time based on mutual recognition by both institutions of each others programs for advanced standing. The opportunity of students obtaining two degrees from both the local and overseas university is seen as an attractive option which will enhance employment prospects. The advantage for the foreign university is that the students will study in a wider range of disciplines. There are also advantages in developing stronger relationship in teaching and research with the two institutions concerned such as visiting staff. Issues related to

scholarships for study abroad for top students and for foreign students to study in China are usually discussed in relation to this new development.

Foreign University Joint Programs offered in China.

The delivery of foreign university programs in China is not new but has in the past been problematic. Major concerns with such programs include difficulties in delivery of program equivalent to that offered in home country, viability of programs due to English entry requirements and the transfer of income from China to home country. Some universities from Australia and other western countries have found it very difficult to successfully run programs in China and have in many cases have closed down programs following financial loss, quality related issues or change in regulations. Some universities followed delivery models used on other countries in South East Asia and established links with private colleges to deliver programs resulting in issues such as the quality of teaching staff and the lack of attractiveness of the program to Chinese students.

Data published by the Australian Vice-Chancellor’s Committee (AVCC) in May 2003 list 157 offshore bachelor or Master programs in China undertaken by Australian universities. At the same time only 72 foreign programs in total were approved by the Ministry of Education with the others relying on approval at municipal, provincial and local government level.

The data showed that 27 Australian universities had current offshore programs in China (excluding Hong Kong SAR) suggesting China as a major site of offshore activity for a large majority of Australia’s universities. Offshore programs in China represent 13 percent of all reported current offshore activity by AVCC members. Fifty-three percent of Australian joint programs in China are offered by 3 universities-- Charles Stuart, Southern Queensland, and Victoria. By level, 50 percent of programs are at the master’s level, 29 percent at the bachelor’s level, with the remainder a mixture of postgraduate and undergraduate certificates, diplomas, foundation courses, and English-language provision. By subject, approximately 60 percent of provision is in the broad area of business and management, with IT, law, and education the other prominent disciplines.

As a result of many of the issues related to delivery of unapproved joint programs with private providers the Chinese government, while wishing to encourage the establishment of private higher education institutions and foreign university programs in China, established guidelines which protect the Chinese students and at the same time benefit the foreign institutions. The interim guidelines released in July 2004 provide the opportunity for collaboration between Foreign universities and Chinese Higher Education Institutions in the delivery of Foreign University Programs in China. As part of the provisions there is a need for Foreign and Chinese University to gain approval from the Ministry of Education to deliver foreign joint venture education programs. In June this year the Chinese Ministry of Education released the latest list of currently approved Chinese / foreign joint venture education programs. This list sees Australia as the most prolific foreign provider in this area; responsible for the delivery of 48 of the total 164 approved programs.

All programs on this list are at Bachelor's level or higher. A brief profile of the Australian programs being delivered indicates the following:

Location:	30% +	Beijing
Subject:	50% +	Accounting, Business & Management
Level:	70% +	Masters.

Edith Cowan University (ECU) has taken a conservative approach to the delivery of its programs offshore in China. Currently the university is delivering Masters programs in Business, IT and Education with higher education institutions in China which have been approved by the Chinese Authorities. In the case of the Masters program in Business the program is delivered as an International degree in bilingual mode. The university has established clear policies and guidelines to maintain the quality of the program. These policies recently gained a commendation from the Australian University Quality Agency audit of the university AUQA (2004)

The introduction of the Master of Information Technology in conjunction with the Graduate School, Chinese Academy of Sciences (GSCAS) has taken a different approach. In this case the program is seen as strategic in that it is being delivered in conjunction with an institution of high reputation in Beijing with same entry requirements as program in Australia. The program involves both units from GSCAS and ECU and involves teaching staff from both institutions. The students that have been targeted are part time fee paying Master students who prefer to undertake a coursework Master degree rather than a Chinese Research Degree. By including coursework from the GSCAS research Master program students have a pathway to either complete the GSCAS degree or the ECU award. The program can be completed entirely in China and involves a mixture of online coursework, local tutors and ECU intensive lectures face to face delivered in English. The program is approved by the Ministry of Education which includes both the duration of the program and maximum number of students that can be enrolled. The greatest difficulty with such a program is the English Entry requirements. Meeting an IELTS score of 6.5 or equivalent has been difficult and has involved intensive English preparation prior to and during program. Of the original number who expressed interest only 10% have met the entry requirements. While it would be easier to attract larger numbers if the program was offered in bilingual mode it is the fact that the program is the same as the highly rated program offered in Australia that is the main attraction for the program in China.

Human Resource Staff Development

Increasingly, Chinese universities see a need for their staff to gain international experience. Some universities require their academic staff to undertake professional development at an overseas university to be eligible for promotion. Funding for such activity is provided by government or more commonly by the university concerned. Many universities in China, and in particular the “211” universities, have the resources and desire to send their staff overseas for short course or for more extensive time to upgrade skills, develop collaborative research. Edith Cowan University is exploring these opportunities with a number of universities in China particularly where the institution is seeking long term collaboration in a range of other areas such as course delivery and research.

CONCLUSION

As indicated earlier, with the support of government, the Chinese Higher Education system is undertaking major reform at a rapid pace. Like institutions elsewhere the Chinese institutions not only see the need for internationalisation but also the benefits in terms of income generation and recognition at the global level. While the government has allowed and encouraged this development it has established policies and guidelines to protect both the Chinese citizens and the institutions from unacceptable practices and low quality programs. With the increasing demand for education outstripping supply and the acknowledgement and recognition of Foreign providers by Chinese Ministry Education there is an excellent opportunity for Australian Higher Education Institutions to establish long term relationships with Chinese Higher Education partners.

While there will be challenges relating to developing and sustaining long term relationships, cultural and language issues and changing government approval processes the benefits far outweigh the risks. Edith

Cowan University has identified the opportunities and is established key strategic links in China for mutual benefit for both the short and long term onshore and offshore.

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Das, K. St. Theresa Inti College, Thailand. Sustainability Of Higher Education In Developing Countries Under Globalized Regime

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ABSTRACT

The pragmatism of globalization of knowledge has generated an over optimism around the globe. It is being projected through out the globe, as an impetus having no alternative. It is being regarded substantively as the growing interdependence and interconnectedness of the world that is the part of the logic of modernity. It is expected to create unprecedented new opportunities for sustainable development. But in fact globalization poses a great challenge to the sustainability of higher education in developing countries. This paper examines the effect of free marketism in higher education of India and Thailand. It highlights the problems of higher education in the long run and short run. The methodology adopted in this study is primarily qualitative and interpretive in nature and attempts to capture the social dynamics that form the sustainability issue in higher education. It examines the prospects of higher education and fate of the society in the emerging new economic order of the new millennium. It argues that the present educational system thrives on educational dualism and promotes that type of professionalism in developing countries which is very conservative and myopic. It ensures individual success at the cost of social welfare. This paper makes out a case for having a sustainable higher education system which will promote neo professionalism and value-based education in order to have a knowledge-based society for developing countries.

1.0 INTRODUCTION

Globalization is a global economic movement of economic integration. Its impact has become all pervasive. All sectors of developing countries seem to be vibrating with economic buoyancy. It has generated an atmosphere of over optimism of instant economic growth. There is expansion of trade, investment, market, and increase in GNP, productivity, per capita income, profit, efficiency, salary etc. Life styles of metro people in developing countries have become more attractive, comfortable and fashionable than ever before. Premature replication of features of the industrially advanced countries are observed with developing countries. The new reform process pursues economic growth to the best of its ability until it is distracted by other issues like education, health and environment. It adopts the rhetoric of all these issues pretty easily. But, with the conservatism at its core, it only tries to adapt to these considerations without giving up its basic goal. It puts over emphasis on economic efficiency and modern urban sector at the cost of the larger society. Economic reforms tend to aggravate and exaggerate the inequality created by economic growth. There is upward trend of growth of the economy without involving the majority of the population or reflecting their needs and requirements.¹ Economic growth in many developing countries is partly superficial, based on borrowed money and technology, with no inner dynamism generated by indigenous technological capacity. One must always remember one simple thing that the salvation of the developing economy lies only in the transformation and revitalization of its peoples' economy, which is possible through human capital formation, which makes the role of the state inescapable. But the developing countries, relegating the state to the background, are heading towards a techno-economic fragile transformation but not towards the prosperity of people or social transformation that they need. With the euphoria of globalization and 'high-tech civilization', the concern for the people or social development is dismissed as an obsession of egalitarian romantics. It discriminates between those

equipped to seize its benefits and opportunities and those limited by their education, location and assets. The counter point of urban triumph is rural decline. ² There is hyper growth of the tertiary sector, in which education constitutes the major component. Both first generation and second generation reforms overlook various social objectives such as education, health, social development, gender inequality, regional imbalances etc. It rather runs counter to these objectives by resorting willy nilly to the trickledownism. It tends to negate and neglect the priorities of the society at large. The free market policy is extended to all sectors including health and education, under the justification of higher efficiency, economic viability and pragmatism of sustainability.

1.1 HIGHER EDUCATION IN THAILAND

Thailand has been a soft state always. The government’s prudent and passive role has become a tribute to *laissez faire* policy. Trade and Business in Thailand have reveled in the atmosphere of ‘free-for-all’ ;and this reveling has contributed to the strength of the current economic boom. ³ In order to maintain this boom complete reorganization of educational administration and management in the country is warranted urgently. The report of the taskforce convened by the World Bank and UNESCO says that higher education promotes meritocratic civil society and values in order build a pluralistic accountable democracy. It helps in human capital formation of the country. Higher education is never a luxury for any country. It is very much critical to and indispensable for the competitive strength of the country. Education is considered as the most important factor in building human capability in order to enhance the capacity and competitiveness of any country. The economic vulnerability has underlined the urgent need for reforms in the educational system because it is realized that the weak human resource base has been the major factor behind economic slowdown in developing countries. Therefore, effective mobilization of resources and investments in education, allocation of budget and budget management are essential for the success of educational reform.

In accordance with the requirements of section 81 of the new constitution of 1997, the first National Education Act of Thailand was promulgated and came into effect on 20th August 1999 to serve as the master legislation on education. The new system of educational quality assurance in Thailand has been introduced to ensure the improvement of educational quality and standards of the learners. Both internal and external quality assurance have to be implemented in an increasing the number of basic and higher educational institutions in the country. Transition rates in Higher Education in Thailand are shown in the following table(1.1) during 1997-2002

Table: 1.1
Transition rates in Higher Education in Thailand 1997-2002(%)

Level of education	1997	1998	1999	2000	2001	2002
Higher education*	92.8	81.8	75.9	75.0	80.2	91.9
Diploma	55.9	50.7	46.1	49.2	43.4	43.6
Undergraduate	36.9	31.1	29.8	25.8	36.8	48.2

*excluding new entrants in open universities

Source : ONEC, Thailand Education Statistics Report 1996-2000, Thailand Education data 2001 and Bureau of Educational Research and Development

As mandated by section 33 of the National education Act, 1999, a 15-year national educational plan was prepared by ONEC and authorized for implementation by the council of ministers in June 2002. It serves as a long-term strategic plan to ensure harmonization of the efforts for educational reforms throughout Thailand and also the framework for formulating the development plans pertaining to basic education, vocational education, higher education as well as religion, art and culture. The enrolment of students in higher education of Thailand is represented in the following table 1.2. The total enrolment in higher education in Thailand has substantially grown under the globalized regime.

Table: 1. 2
Enrolment of Students in Higher Education of Thailand 1997-2002

Level of education	1999	2000	2001	2002
Diploma	455080	470002	462187	439363
Undergraduates	1099219	1232215	1294561	1371058
Certificates	2864	2615	2324	2138
Master degree	83936	89818	108055	108774
Doctorate	2348	3190	5080	5120
Total	1643447	1797840	1872207	1926453

Source: ONEC, Thailand Education Statistics Report 1996-2000, Thailand Education data 2001 and Bureau of Educational Research and Development, Bangkok

It is seen from table 1.3 that the average years of educational attainment of Thai population has been increasing more in the era of globalization.

Table 1. 3
Average years of Educational Attainment of Thai population 1999-2003

Age Group	1999	2000	2001	2002	2003
15 & above	7.1	7.2	7.4	7.6	7.8
15-21	9.4	9.5	9.6	9.7	9.8
15-59	7.7	7.8	7.7	7.8	7.9
60 & over	3.5	3.6	3.7	3.8	3.9

Source: Bureau of Educational Research and Development, Bangkok

Recently the Thai Government has taken appropriate steps for quality improvement in higher education. The Royal Decree of Thailand had established the public office for National Education Standards and Quality Assessment (ONESQA). The main goal of ONESQA is the achievement of educational reforms mandated by the national educational Act 1 of 1999.

ONESQA has identified the following six strategies:

1. Encouragement of educational institutions for adoption of internal quality assurance
2. Dissemination of information regarding the importance of quality assurance
3. Development of efficient system for external assessment of educational institutions
4. Synthesizing the outcomes of external quality assessment
5. Development of lead resource persons for quality assurance
6. Networking of institutions and individuals inside and outside the country

ONESQA , in order to achieve its mission, has identified the following policy guidelines:

- Emphasis on educational quality and efficiency in functioning of academic institutions
- Flexibility in functioning :independence, integrity ,responsibility and accountability for an effective check and balance
- Promotion of educational institutions for their development to the highest potentiality
- Establishing an information system for linking all agencies/stake holders concerned
- Assessment for quality enhancement not for either reward or punishment
- ONESQA will only develop the method of assessment (not do the assessment itself)
- External assessment must be transparent and supported by concrete evidences
- Private, professional or academic organizations will be encouraged to participate in the training of external assessors
- Selection of external assessors shall be based on the criteria of competency for accreditation and registration and periodic assessment of these assessors
- Networking in order to create awareness of collective responsibility for educational quality(in order to avoid authoritative superior body)

These are very good reformatory measures no doubt. But the real achievement in this direction can be examined after five years. Now it is too early to review the effectiveness of these strategies or conclude anything.

The success of the educational reforms lies in higher achievements in terms of access, quality and efficiency leading to higher quality of life for Thai people and competitive advantage for the Thai economy. The present educational system should be reorganized to allow and enable the learners to transfer their learning outcomes to the society through all types of education, formal, non-formal and informal education. There can be a learner-centred approach and a teacher-centred approach. But regardless of the approach, it should not only improve the quality of teaching and learning but also encourage life long education for the learners and enhance the relevance of education to the society. It is expected to be the key factor in transforming Thai society into a ‘knowledge-based society’.

Educational reform is warranted in order to keep up with the imperatives of new world economic order. It is widely appreciated that educational reforms should become the national agenda with top priority now. The higher education should no more be a luxury for the society. All sections of people should share the benefits of globalization. The Government has to play a proactive role but not a passive role.⁴ All sections of people should pursue the same objective that education should provide necessary skills and knowledge that prepare and allow all individuals to become productive members of a ‘knowledge-based society’.

1.2 HIGHER EDUCATION IN INDIA

The Ministry of Higher Education in India has undertaken a series of reformatory measures after globalization. It has been aiming at curtailing subsidy and downsizing higher education through public funding. The Privatization process in education has become very strong. Private educational institutions are growing very rapidly. As direct disinvestment in education is not very easy, Government of India is adopting many indirect measures to transfer education safely to the private sector. It has been promoting autonomous colleges and deemed universities and neglecting old universities. It has encouraged and introduced new courses having job marketability. With minor tinkering the courses are revised and credit hours have been increased. In India, the following four steps have been boldly adopted under liberalized regime:

- Complete freeze on recruitment

- Complete ban on creation of new posts
- Abolition of all vacant posts which are vacant for more than one year
- Ad hoc reduction of 10% of total staff strength

These steps are based upon the fifth Report of Expenditure Reforms Commission, March 2001. In fact, the 9th report of Expenditure Reforms Commission emphasizes that “higher education is very important and the Government should take appropriate steps to strengthen it”.

The Educational policy and planning of the government of India has generated a very dismal and appalling situation for India. The overall educational index (OEI) of India has remained very low, having the rank of 141 among the comity of nations, while Sweden has the highest rank in terms of educational index in the world. It is seen from table 1.4 that India’s educational profile is not very impressive even after privatization. But India seems to be complacent with its euphoric success in producing the larger number of ‘cyber coolies’ in the process of out sourcing of the western world.

Table 1.4 : Overall Educational Index of India

Countries	Rank	OEI
Sweden	1 st	0.99
China	96	0.62
India	141	0.57
Thailand	70	0.84

The public educational investment is very low in all developing countries. Countries like USA, Sweden, France and many advanced countries invest 10 times more on higher education. North America has 9 times more teachers, Europe has 5 times and Latin America has 3 times more teachers than India and Thailand.. There is persistent lack of commitment of the public sector in India particularly in the education sector. The expenditure on higher education in India is only 13 percent of total public expenditure as compared to 27 percent that of Sweden. It is shown in table 1.5

Table 1.5 Expenditure in Higher Education

Countries	PEE/ GNP	PEE/Total Expenditure	HEE/Total Expenditure
Sweden	8.3	12.2	27.2
Norway	7.4	16.8	27.9
India	3.2	11.6	13.7
Thailand	4.8	20.1	16.4
China	2.3	12.2	15.6

PEE = Primary education Expenditure, HEE = Higher Education Expenditure

The University Grants Commission(UGC) , which is the national funding agency and regulatory body of higher education, has not only failed to bring qualitative changes to the academic system it has also allowed some of its well-intentioned initiatives to go to waste due to half-hearted measures.⁵ There are huge disparities in fund disbursements to the universities. The share of development grants to only 15 central universities has steadily increased to 53.43% of the total grants and for others it has substantially decreased. All other 212 deemed and state universities received only 46.57 % of the total grants. Till 1999-2000, only six universities and 79 colleges had been assessed for standards of teaching under the

auspices of National Accreditation Council (NAC). The recommendation of the UGC on setting up of Curriculum Development Centers (CDC) still flounders for lack of any mechanisms to monitor its implementation in the universities. Much-needed reforms in university curricula (which should be stimulating and innovative) remain unaddressed. The UGC set up 27 CDCs (Curriculum Development Centers) in 1986 to suggest measures to modernize and restructure courses and to develop alternative models. However, the Rastogi Committee observed in 1997, that only about 1/3rd of the universities have implemented the CDC reports on different subjects.⁶

The present Higher Educational System (HES) is closing many old courses and neglecting old colleges/universities, which has less or no job prospects. It is encouraging new colleges and new courses having job-market orientation for the urban sector. The academic load and number of papers in various degrees for the students has increased. Donations and course fees in BT, IT and FT (Bio technology, Information technology and Fashion technology) courses has increased like any thing. Indian parents in cities have become too crazy to analyze the real worth of the degree. They used to sell their property to invest in the admission of their son/daughter in these courses. Therefore higher education has become more a 'means and end' of luxury of the upper class only. The trend has become more pronounced and pervasive during the current decade of liberalization.

The job market indication has become a powerful. It is widely accepted in India now. It is very attractive wave. But it is highly transient, inconsistent and deceptive. It is unfortunately deciding the fate and future of the emerging knowledge-base of the society. The job market fluctuates for several temporary causes and spurious external factors⁷. Parents used to invest heavily and therefore expect high returns from the job market. The salary of few 'two-in-one' degree holders working in 'three-in-one jobs' in the metros has increased beyond expectation. It generates only high expectation and eventually results in high frustration among the urban-youth. Ultimately that results in high labour cost and production cost, which are added to the price and shifted to the shoulder of the innocent consumers only. The educational reform has now linked all grants and public funding with the assessment of performance of the academic institutions. It has become counter productive. As a result, the quality of education and examination/evaluation standards have been deteriorating in academic institutions more so in so-called autonomous institutions.⁸ It has encouraged self-financing courses in both public and private universities/colleges. It has introduced many study loan schemes for the students going abroad. But the returns from higher education to the society in real terms has remained very low. This argument does not uphold the view against commercialization of higher education. The fact remains clear that commercialization of education is becoming a very powerful process where the return to the society in the long run remains a question. Ironically it is widely accepted among the educated class of urban society. The policy makers sit on the ivory tower of success and remain increasingly insensitive to this perverse trend. But it only promotes individual interests, not social welfare.

1. 3 NEO LIBERAL ORIENTATION IN EDUCATION

The impact of external funding agencies seem to have been legitimized and accepted for all sectors of developing countries including the social sector. Education as an investment in the social sector is given wide publicity in this decade. These trends suggest a movement towards a neo-liberal economic orientation in which capital and the market (rather than policies and the state) gain hegemony; and ideas of competition, productivity, efficiency and profit, prevail over ideas of equity and social desirability. As the World Bank is a major funding agency for many developing countries, it is important to understand the extent to which the Bank's own orientation to decreasing subsidies to the social sector, and promoting market efficiency as a model, have influenced the orientation of the state towards education. The Bank's rationale⁹ for investment in the education sector is based on mainly four economic arguments:

- a) inducing higher rate of returns/increased productivity by having an educated labour force,
- b) increasing the flexibility, efficiency and receptivity of labour market, with better quality education,
- c) raising willingness to purchase and use green revolution technologies and high yielding seeds, and
- d) enhancing women's education so as to lower fertility rates and increasing women's participation in labour force

All these are popularly known as the 'human capital' perspective, in which education is regarded as a 'productive investment'. It is quite convincing and logical. Although not stated in such reductionist terms, the education policy of the Government of India has been framed by the same perspective since the 1990s. Similarly there is pervasive informal influence of the World Bank on the educational system of many developing countries.

The World Bank has an indirect role in directing this agenda of human capital formation in many developing countries. This was made more explicit in the 'EDUVISION' seminar held in Bangalore.^{8 10} The vice-president of the World Bank, in his key note address highlighted that he visualizes a future where markets will play a significant role in education. He promoted the idea of 'autonomous institutions' as the viable model in the future.¹⁰ Though year-long consultations were reportedly held with several groups of people, these were select invited fora. There was no open forum for engaging with real issues and problems of the education sector. Even the Education Task Force,¹¹ was completely left out of the entire process. Teachers' associations and unions were conspicuous by their absence at all levels of consultations. It is obvious that there were some closed and selective consultations which produced a consensual perspective. Even a year after its 'release', the 'Eduvision' document, is available only in a draft form. not to be quoted at any occasion. . Supposedly written with contributions by several local consultants, it is largely consistent with the agenda that the World Bank upholds. We find in it, no serious engagement with issues of equity or quality. There is no mention of how the state will address and alleviate the multiple disadvantages faced by a large number of students, and instead recommends further investments in quality improvements and in research and development. Nowhere does the report indicate what per cent of the state's budget must be committed to higher education.

Therefore educational reform has created more an euphoria and fake optimism rather than real quality-improvement in educational system. Opening or closing of a college or a course in the university or research institutes should not depend on the job market indication.(It can be the goal of a training institute or of a polytechnic). But the fate of a subject/degree/college should not fluctuate with the fluctuations in the job market. The subject should not sink or swim in accordance with the degree of buoyancy in the job market. Knowledge-base of the country should not afford to dance according to the tuning of the market. Because knowledge has permanent value. Knowledge is always universal. It is never contextual, temporal, national or regional or personal property. But present educational reform increasingly aims and makes knowledge as a personal property to be patented and used for individual's success. On the other hand, it is an irony that it aims at building a knowledge-based society.

Downsizing higher education in developing countries eventually may lead to 'intellectual marginalization' and isolation. It is by design but not by default. Its series of social and economic implications is beyond perception, because it violates the constitutional obligations of the country. Many types of socio cultural problems arise due to educational downsizing. It is likely to produce an appalling situation in the future. It has made an orchestrated attack and an offensive strategy against higher education which may precipitate a crisis in future.

That the issue of equity and appropriate policy in education at all levels in general continues to be dodged by the state government in creating frequent crises and tensions that the state faces with different education sectors and agencies. These contradictions are glaring and increasing. It cautions us about the worsening situation that may develop if such externally- funded philosophy are permitted to become the normative form in which state obligations to governance and provisioning of public goods are defined. In the absence of a guiding policy framework, projects promoted by external funding agencies, which now include many private corporate philanthropic ventures, seem to provide the state with its social welfare fig leaf. The extensive media coverage has also become good publicity for the state, donors and private investors. In the context of a fragmented political apparatus, a co-opted media and an indifferent intelligentsia, there is greater need to be more vigilant about such trend and to seek alternatives which will enhance the systemic capabilities of the states. There is an urgent need for higher education to derive from a policy that is built on the norms of democracy, equity and sustainability.

1.4 HUMAN DEVELOPMENT IN DEVELOPING COUNTRIES

Human development is very low and slow in developing countries. The trend and position of India, China and Thailand in the ladder of human development can be perceived from the following comparative table. Therefore higher education is very crucial parameter in bringing human development, gender development and social development of developing countries.

Table -1.6 : Human Development Index

Countries	1975	1980	1985	1990	1999	2000 (Rank)
Thailand	0.604	0.645	0.676	0.713	0.749	0.762 (70)
China	0.523	0.554	0.591	0.625	0.681	0.726 (96)
India	0.407	0.434	0.473	0.511	0.545	0.577 (124)
Japan	0.854	0.878	0.893	0.909	0.923	0.933 (9)
USA	0.863	0.884	0.989	0.914	0.925	0.939 (6)

Source: UNDP Human Development Reports, different years

In developing countries the per capita GDP is very low in comparison to the advanced countries. It is also seen from the GDP index. It is as low as 0.55 in case of India. On the contrary it is observed that the human development index is very low in developing countries. The HDI rank of Thailand and India are 70 and 124 respectively. The GDP minus HDI rank is positive in case of Japan and negative for India and USA. It implies that there is inconsistency between in human development and economic development. Higher economic development does not automatically leads to better social development. The Education index is very low for developing countries. It is 0.57 for India and 0.84 for Thailand while it is 0.98 for USA. The adult literacy rate is very low in developing countries. It is 57 % and 84 % in India and China respectively. The Net secondary enrolment ratio is also very low in developing countries. The Public expenditure on both secondary and tertiary education as a percentage of total public education expenditure (TPEE) is very low, in comparison to that of Japan and USA. Gender discrimination is also quite perceptible in all developing countries except Thailand. The Female literacy ratio is 45% and 76% in India and China respectively. The Gender Development Index

Table - 1.7 : Education Related Variables in Developing Countries

Indices and Variables	Thailand	China	India	Japan	USA
PCGDP\$(per capita GDP)(2000)	6402	3976	2358	26755	34142
GDP (Gross Domestic Product) index	0.69	0.61	0.53	0.93	0.97
GDP rank – HDI rank	0	0	-1	2	- 4
Education Index	0.84	0.80	0.57	0.93	0.98
PTEE / TPEE in %	16.4	15.6	13.7	12.1	25.2
PSEE / TPEE in %	20.0	32.2	26.5	41.8	36.1
ALR (Adult Literacy Rate)	95.5	84.1	57.2	100	100
NSER(Net Secondary Enrolmt. ratio)	55	50	39	-	90
RDE / GNP (in %)	0.1	0.1	0.6	2.8	2.5
SERD per million Population	102	459	158	4960	4103
PGR (Patents Granted to Residents)	1	1	1	994	289
FLR (Female Literacy ratio)	93.9	76.3	45.4	99	99
GDI(Gender Development Index) (rank)	0.760 (60)	0.724 (77)	0.560 (105)	0.927 (11)	0.937 (6)
HDI rank –GDI rank	1	3	-2	-2	0
PSV(Political Stability lack of Violence)	0.21	0.39	-0.05	1.2	1.18
GE(Government Effectiveness)	0.1	0.14	-0.17	0.93	1.58
CPI (Corruption Perception Index)	3.2	3.5	2.7	7.1	7.6
Freedom of Press	29	80	42	23	15
TOT (Terms of Trade)	72	105	148	196	116

(GDI) is very low in developing countries. Rank of India and China are 105 and 77 respectively. The difference between HDI and GDI is positive for Thailand and China but negative for India and Japan. It implies that there is again incompatibility between human development and gender development. Higher human development does not necessarily imply better gender-neutral development.

Research activities are not encouraged by developing countries. It is also left to the market forces. Government's emphasis on Research and Development in developing countries is very less. The expenditure in R & D is only 1 % of GNP in Thailand and 0.6 % in India. The number of Scientist and Engineers per million of population is only 102 in Thailand and 158 in India, while it is 4960 in Japan. The patentability of research output has regressive impact on developing countries. The research and knowledge has remained the captive monopoly resources of developed north. After the establishment of WTO, the number of patents granted to the developing countries has not improved. Patents granted to the residents of India, China and Thailand is only one each, while Japan has received 994 patents till now.

The political instability is very high in developing countries too. The index measured by UNDP shows that India has negative PSV (political stability and lack of violence) index. Similarly, the corruption perception index is very low, while corruption level is high in developing countries. It is 2.7 and 3.2 for India and Thailand respectively. The effectiveness of the government is also very low in developing countries. It is 0.1 for Thailand and negative(-0.17) for India. The freedom of press in developing countries is also low. Even the terms of trade has not been impressive. It is 72 for Thailand, while it is 196 for Japan. Therefore Government of developing countries can not afford to adopt *laissez faire* policy

but has to play a proactive role in education sector. The fate of higher Education and research can not be left to market forces. The sustainability of higher education depends on the appropriate macro policy framework. Developing countries have different social and educational characteristics. The higher education system can improve all these characteristics. Therefore the role of the Government in the educational sector has to be different and proactive in developing countries due to following reasons: low human development, low education index, low level of enrolment, high female illiteracy, high gender inequality, lesser technological advancement, lesser freedom of press, high degree of political instability, lower government effectiveness, low perception on corruption and adverse terms of trade.

1.5 EDUCATIONAL VACUUM IN DEVELOPING COUNTRIES

Globalization has brought fundamental changes in the approach to higher education and research in developing countries. It has substantially reduced the subsidy and financial support to academic institutions of all developing countries. It may help the advanced countries to promote their intellectual properties as their 'captive resource'. It is providing incentives for the growth of informal education. Because the formal education is the formidable adversary to the informal education system. It helps to create sufficient space for non-public universities such as transnational cyber universities and franchised institutions, which operate only on the basis of commercial parameters. It has become very attractive for all in the short run. But the private sector, left to its own devices, pursues short term gain with no vision of long term development¹². There is sharp increase in enrolments and fees, but we still do not have any reliable information on functionality and quality in these educational institutions. It ensures the quantity (not necessarily the quality), may satisfy all criteria of economic viability and intra generational sustainability but not necessarily the criteria of secular (inter- generational) sustainability.

Now the aim of higher education is merely to prepare students for different jobs or employment opportunities or to train students to become robotic labourers or so called professionals. At best, the aim of primary and secondary education and polytechnics, Industrial training institutes can be that much. But the wide ranging attributes and advantages of higher education and research are undermined and dictated by the market demand for efficiency, economic viability, returns, profitability and productivity. Market-relevance does not necessarily imply social desirability. Achievement of intra-generational sustainability ends up in a "pyrrhic victory" where 'means succeed and ends lose'. It is unfortunate for any healthy society. This trend in higher education may not be sustainable in the long run perspective. Because it has an unintended consequence of producing an "educational vacuum" for the society at large. In the long run the developing countries tend to suffer from a 'dependency syndrome' and remain deficient and deprived. A country can at best aim at having an information-based society. But it can not dream of having a knowledge-based society. Ultimately it suffers from lack of research output and lack of scholars, scientists and experts which constitutes the 'think-tank' of the country. The society does not get a wizard, scientist, mathematician, Physicist, genuine scholar after few decades. Because all good students now are running after lucrative jobs as per the imperative of commodity-centric society and as per the new trend of higher education. Maximization of the short run individual objectives is being done at the cost of long run social objectives. The society ultimately remains neglected and bypassed. The academic system without research becomes ultimately stale and sterile. The education which tends to remain relevant to the market and more so for job market is unlikely to remain relevant to the society and even to its own sustainability. Because an educational system, which is viable and economically efficient may not be socially just and desirable. The knowledge-based society never emerges from this kind of regressive educational system. Every body now used to believe that there is 'knowledge explosion' in the entire globe. This is a semi-myth. There is simply information-boom and explosion of awareness about facts and market functionings. In the search of marketability of new courses and seeking tangible returns from the degrees, the real pursuit of enhancing the quality of education in academic institutions is undermined; and the academic excellence, expertise, and scholarship are safely ignored. Thus academic institutions are

not likely to become centre of excellence but centers of mediocrity only. The self confidence among the students may not develop, while the servility , timidity and serfdom may increase. The creativity may be benignly ignored and the analytical faculty among students may not be recognized by the present higher educational system . A very brilliant student may have lesser chance of being rightly rewarded.

The unbridled commercialization of higher education in developing countries, unfortunately, may result in the ossification of creativity in the educational system. By commercialization the mathematician can be happy at the cost of Mathematics and physicist can become rich at the cost of Physics. The disciplines of knowledge may remain neglected, sterile and stagnant. Each branch of study may remain as the stepping stone for the stakeholders and eventually it itself may perish .The quality of higher education is benignly neglected. Therefore the education system flourishes at the top but perishes at the bottom. It has a built-in-doom. Thus sustainability of higher education is at stake in the long run.

1.6 EDUCATIONAL DUALISM IN DEVELOPING COUNTRIES

After globalization, the educational dualism is becoming more pronounced in all developing countries. The success of higher education system (HES) thrives on social polarization and pillage of economic vitality and vulnerability of the civil society. As a result the renteer economy expands very high and parallel economy grows very fast. The social priorities regarding education in all developing countries are never reflected in the budgetary allocations. It does not give due weightage to the quality of education which is vitally important. The quality can be achieved through both private institutions and public institutions. But there is a overt and undue attack on educational institutions owned by the public authority. They are always known and condemned as inefficient, corrupt, slow, lethargic and ineligible to produce students relevant for the job market. It is widely believed that public ownership is the cause of inefficiency and non-sustainability. In fact, all private sector institutions are not efficient nor all public sector institutions are not inefficient. Ownership and efficiency are mere correlates only. They coexist and are always found together. But they are not causally connected. It is theoretically and empirically unfounded in the entire globe .¹³ Thus educational reform should not mean privatization per se, but genuine quality improvement.

The Higher Education in developing countries may not be sustainable because its present success is not based upon quality but upon a powerful **educational dualism** . Ironically this dualistic pattern is very stable. But this stability and strength in the educational system is socially most undesirable and unacceptable in the long run. This educational dualism manifests in and perpetuates, inter alia, the persistence of:

- Difference in labour productivity
- Difference in employability
- Wage/earning differential
- Casualisation/ contractualisation of jobs
- Gender disparity, subordination women
- Rural urban disparity, hierarchy in access
- High dropout and push out rates in academic institutions
- Child labour and semi-bonded labour practice
- Prostitution, child trafficking
- Voiceless civil society
- Lack of peoples participation
- Economic marginalization and inequality
- Social exclusion, class-caste hierarchy

In developing countries, general household characteristics like income, caste, occupation and educational level of parents continue to determine access, attendance, completion and educational achievements of students. Students from rural families have lesser access than their urban counterparts. It accentuates existing social divisions and reduces commitment towards quality improvement in public educational institutions¹⁴ The gender bias is more pronounced in higher education system of India. It is the daughter who is sent to government colleges and public universities. The son is admitted in the private institutions with huge spending. The son's education is considered to be an investment while that of the daughter is accepted as an unproductive expenditure. This is particularly true for girls and for children from poor and middle income families. The national picture always conceals wide regional differences in gender-inequality again. The emerging dynamics of 'hierarchies of educational-access' has important consequences for the process of teaching and learning. The sharper hierarchy of access persists in higher education. There is gender, caste, class and community bias in education. Both 'quality' and 'access' remain as a great challenge for developing countries¹⁵.

We can no longer look at gender disparities in isolation. The intermeshing of geographic location, social status, economic position, gender, occupation and displacement/ migration has resulted in new forms of disparities and disempowerment. The dualism involving low cost options does not do either; they merely accentuate existing cleavages in the society. The lesson from a range of research studies done in the last 12 years reiterates that there are no shortcuts or magic formulae to address fundamental problems of access, equity and gender disparity on the one hand and quality, content and social relevance on the other. The education has to be perceived as an integral part of both social development and economic development. Different components like physical access, mobilization, quality, curriculum renewal need to be addressed simultaneously -ensuring confluence and synergy. An 'integrated approach' is necessary for meaningful change and sustainable impact.

1.7 STATE OF PROFESSIONALISM IN DEVELOPING COUNTRIES

The higher educational system in developing countries promotes such kind of professionalism which is very conservative and short sighted in its outlook. Present growth of professionalism in developing countries has become more inhuman and myopic. The diploma disease (mania) among the students drives them to seek degrees/certificates as tickets for jobs and upward movement in the ladder of materialistic success. According to Robert Chambers, this professionalism makes strenuous efforts to put all problems into conceptual boxes designed by their professional education. The kind of professionalism, which is being promoted by the present higher educational system, is very conservative and insensitive but it has an inbuilt stability derived from its links with knowledge, power, reverence for established methods, capacity to reproduce itself and defense against any potential threats.¹⁶ The educational reform of the last decade produce such kind of professionals, who hang into old textbooks for their security. The teaching in the universities are reproduced through successive generations. The experience of a teacher (with few exceptions) implies only accumulation of his/her ignorance. The academic institutions suffer from huge inertia, they do not buy books for decades; teachers (with few exceptions) do not visit libraries for years, computers are dust-ridden or at best used at type machines. **The poorer the country the more isolated its professionals are from the society.** The professionals seek security through specialization, simplification, rejection and assimilation. And professionalism in developing countries is embodied in the norms, methods and behavior which are taught, learnt and rewarded. Those who succeed and proceed upwards in the system they feel confident that they know what to do. They feel very complacent. They only assume that the exercise of their learnt skills can establish truth, if they do research or lead to right action, if they are involved in development activities. These conservative professionals have developed a core-periphery gradient. The debate about development have remained incestuously north-north. So there is long experience of failures with this kind of professionalism. It has been well documented that the bias of the professionalism which are urban, industrial, capital-intensive, centralized, high tech, planned and top-down often ignore the majority (or social realities) and make things worse for them. The experience

with the international development projects of WHO, World Bank, UNICEF, UNDP, ILO etc points towards similar conclusions. Therefore development has been a process of growth stimulated by unidirectional movement of technology, always from rich to poor, urban to rural, core to the periphery.¹⁷ With this kind of professionalism, at the end of the 21 century, deprivation and social illfare may become more awful in depth and scale particularly for the developing countries.

1.8 CONCLUDING REMARKS:

The global situation is changing so fast, it is dangerous to make any kind of projection for the social sector, particularly for the education sector. The higher education is very essential and needs to be recognized as vitally important for long run prosperity of the nation and taken as a non- negotiable factor. It is not a stand-alone discrete activity.¹⁸ Therefore, under globalization, the higher education system in developing countries should aim at promoting: ‘neo-professionalism’ and ‘value-based education’ in order to achieve both intra and inter generational sustainability. It can be achieved both by private institutions and public institutions. The ‘quality’ is important not the ownership/organization. None should be blamed or pampered. The goal of sustainability in higher education does not involve the change of ownership. It involves the shift in emphasis/approach for genuine quality and social relevance but not necessarily for job-market-relevance. We need to distinguish between society and market; and their imperatives. Thus intra-generational sustainability involves economic viability, while inter-generational sustainability implies the ‘quality and excellence’ in higher education.

a) NEO-PROFESSIONALISM:

The higher education system should promote such professionalism which is highly sensitive to the society and flexible for holistic development and prosperity. Because development is not a fixed goal nor a unidirectional progress. It is a multi-pronged process of continuous adaptation to maximize the social well-being under dynamic conditions. Therefore, these professional values have to be turned around with a shift towards people-oriented appropriate technology but not necessarily towards high-tech. Researches, approaches and methods are to be more holistic, imaginative and experimental. The research priorities are to be determined by the people but not by scientists themselves. The evaluation is to be done by clients but not by peers. The debate has to be north-south but not north-north. The development process has to be bottom-up not top-down. Such reversal appears to be very radical. But it is necessary and possible through strong determination and educational planning in order to offset the imperatives of education and training and our personal convenience. **Therefore, higher educational system should promote ‘neo professionalism’**, which puts people and society first and poor people first of all. The neo professionals must free themselves from their mental prison. The sustainable higher educational system can reverse this vision by which they can open an intellectually exciting ‘agenda of research’ and move towards a practically- challenging ‘agenda of action’. Therefore, educational reform should aim at promoting such professionalism which should be blended with human face and research should be oriented towards achieving an ever-changing balance between problems, potentials and priorities of the society. The higher educational system should have a strong and meaningful ‘feed back system’ which enhances the self correction and self direction and automatically ensures its own sustainability.

b) VALUE-BASED EDUCATION

The higher education today is endorsed by the modern civilization. The modern civilization, which is becoming increasingly more materialistic and socially-insensitive and disoriented, has shown its bankruptcy in solving the real issues of the society. It grows on the contradictions between economic development and social development and human welfare. Firstly, HES should stand for its own sustainability. Secondly, it should strive for continuous expansion of the knowledge-base, moral values and social development. But the present HES is intended to make man a cog in the giant wheel of

economic development. It should not be confined unfortunately to the narrow goal of achieving a materialistic success. The higher education should not be used only as a means to higher earnings/ position. It should distinguish between legal ‘means’ and illegal means; and between legitimate or illegitimate earnings. Due to this endorsement we encounter the present global syndrome: i.e. ‘all corrupt people in the world are educated’ though vice versa is not true. All stake holders of the parallel economy are highly educated. The illegal economy is detrimental to nation’s human resources. It only promotes a spendthrift consumerist culture. Therefore higher education should integrate materialism with morality and liberation of mind. It should give freedom, promote knowledge, dignity, instill self confidence and ensure liberation of mind of the individual. It should help awareness-raising and confidence-building among the individuals and help to build a fair, transparent and just system for the society. **Therefore we need to have value-based education for the society.** We should not expect a valued-based society from a value-bereft (or value-neutral) educational system. The higher education system should help in building a society which automatically rejects any type of malfunctioning and maldevelopment. Both Gandhi and Buddha preached for liberation of mind from the cyclical order marked by *artha* (money), *kama* (desires), *dharma* (righteousness) and *mokshya* (liberation) so as to enable man to attain *nirvana* (the real peace).

Therefore, the developing countries should initiate meaningful economic reforms and strive hard to build a knowledge-based society, which is attainable through sustainable higher educational system which is only possible through value-based education and neo-professionalism.

NOTES:

1. Kabra, KN (2000) Indian Economy 1998-2000, *Alternative Economic Survey*, Rainbow Pub. New Delhi
2. Phongpaichit, P et al, (1996) *Thailands Boom*, Silk worm Books, Chiangmai, P. 232
3. But free-for-all is not the same as good-for-all. Indeed free-for-all tends to mean good-for-some. (Phongpaichit, P op cit. P. 240) It may be a shocking statement for many because lokanuwat is seen as an impetus or great opportunity having no alternative.
4. All tiger economies depended a lot on their respective governments, which pushed and pulled the entrepreneurs to move rapidly up the technological curve. They invested heavily on human capital first.
5. The CAG (Comptroller of Accounts General) report says that UGC’s management of scarce development resources as “unimaginative and reckless”, because UGC is said to be disregarding all accountability parameters.
6. The Rastogi Committee is also critical of UGC’s inability to modernize the curricula and formulate an acceptable package of examination reforms. But on the other hand the UGC steps into other areas where it has no jurisdictions. It is unfortunately promoting astrology, yoga, jyotir bigyan, purohitya etc to be taught in colleges and universities.
7. The most horrendous event of Sept 11 in New York, Stock market crash of US or Japan or down turn in the economy of eastern tigers etc are less relevant and more superfluous for the educational system of a nation.
8. When the autonomy of the universities is continuously eroded by various types of new rules, Acts and governmental interference we are promoting autonomous colleges and institutions. There is always aided programmes and guided policies. So autonomy has become a mockery. The proliferation of deemed universities and autonomous colleges in India have spreaded the ‘deem culture’, where there is glamorous campus, less transparency, and dilution of academic quality and integrity.
9. Ramachandran, Vimala and Aarti Saihjee, (2002) The New Segregation : Reflections on Gender and Equity in Education, *Economic and Political Weekly*, Vol. 37(17) April 27th

10. The Seminar, though supposedly organised, funded and conducted by the state, was graced by the presence of a number of World Bank personnel including the vice-president of the World Bank, Josef M Ritzen, who visualises autonomous, non aided and non-profit institutions, as the viable model in the future.

11. The Taskforce was set up by the same Government of India. Taskforce and committees are always expected to add credibility and theoretical rigour to the whole exercise. Perhaps a bigger danger of such professionals and moneyed agencies working so closely with the government is that they may substitute for genuine democratic processes and structures.

12. Phongpaichit, P. et al, (1996) op cit, P.236

13. This is the well known remark of Professor Oscar Lange

14. This differentiation accentuates the precarious position of the disadvantaged groups in terms - of access to basic education both quantitatively and qualitatively. This tendency, *if* allowed to continue, will further aggravate the existing serious inequality of access in higher education, thus making a mockery of the notion that "education is the most potent instrument for achieving greater equality of opportunity", Vaidyanathan and Nair 2001.

15. These types of bias persist and are reflected through attitudes of politician, teachers and educational administrators. So the entire education system should be fair; gender-neutral and caste neutral

16. According to Robert chambers, today's Professionalism has many virtues. It obtains degrees and diplomas as a ticket for jobs or for upward-movement in the organizational hierarchy or for geographical shift to ever larger urban centers. They seek self- advancement and look upwards for different awards and rewards. But this type of professionalism has three major weaknesses: inbuilt gaps, misuse of methods and prior bias. It is generated only in core conditions to fit into the core problems. It, willy nilly, gravitates towards the core list of activities and agendas. The disciplines, professions and departments are so interlocked that the gap between theory and practice safely persists. It gives autonomy and legitimacy to many wrong or inefficient outcomes and socially irrelevant decisions.

17. The development is not a fixed goal. It is not by blue print. It does not involve rapid change and standardized action which creates dependency of the majority. Education-Development link should grow by sharing experience, gradual and diversified action which empowers the majority of people. The neo professionalism should be pragmatic enough to reverse the existing power relation. It should make the development process people-oriented with holistic approach. The priorities should not be projected by the educated professionals but should be perceived by the people. The neo professionalism has to have four interacting levels: normative, conceptual, empirical and practical. The Professional need not be an expert with closed mind but a continuous learner, who makes continuous adaptation to social complexities.

18. The role of the Government in higher education is indispensable. It can not be performed by the private sector alone. The government has to acknowledge its importance of looking back and looking forward. Good Schooling which is the critical input into higher education, creates the necessary suction effect in later stages.

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Garner, S. Edith Cowan University, Australia. The Encouragement of Student Collaboration in a Technical e-Business Unit

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ABSTRACT

This paper concerns the teaching and learning methods, together with the tools utilised, in a third year undergraduate unit in the e-Business major at Edith Cowan University, Australia.

The unit is entitled Web Commerce Development and it is relatively technical compared to other units within the major. The unit's aim is to expose students to e-Business technologies such that they gain an awareness of where and when to use those technologies. Many students are not 'IT' students and find the unit demanding.

The cognitive load on the students has been kept relatively low and collaboration between students has been encouraged. This has been done by utilising the following:

- A book of weekly readings together with weekly question sheets that students are encouraged to answer in groups.
- A first assignment which is done in groups. Students are given an open ended question each week and they have to post an answer to an online content management system. Each group also has to post at least one 'reply' to another group's posting such that it adds and enhances that posting. All of a group's postings and replies throughout the semester form a portfolio which is the basis of their first assignment.
- A second assignment requires groups of students to develop a web-based e-commerce system by utilising special 'shopping cart' software tools. The groups are encouraged to collaborate with small businesses. Such tools allow students to upload their final 'shop fronts' to a Web server, thereby allowing other groups of students to test their sites and place dummy orders for goods.

An online evaluation of the unit was undertaken. The findings indicated that students found collaborating in groups both enjoyable and helpful in their learning. The findings are fully discussed in the paper.

INTRODUCTION

The area of e-business has increased rapidly over the last few years and university courses have been introduced to reflect this. The school of Management Information Systems at Edith Cowan University, Australia, introduced a new undergraduate major in e-business to augment its information systems major which it has run for many years. Most undergraduates take two majors, and this new major not only attracts students who are taking an information systems major, but also those from other disciplines such as marketing.

Most of the units in the e-business major are of a non-technical nature, however a new unit was introduced to help students learn about the technological issues involved in constructing web-based e-business systems. This third-year unit is entitled Web Commerce Development and it has proved challenging for many of the students who are not taking an information systems major and who generally have much less prior knowledge of technical issues.

This paper discusses the design of the unit which has aimed to reduce the cognitive load on students so that they are able to cope with the unit and have a meaningful and useful learning experience. To this end, student collaboration has been actively encouraged. The paper begins by outlining a teaching and learning framework that was used in the creation of the unit structure. It carries on to explain the learning resources, tasks and supports that have been used in the unit, and it finally discusses the results of a questionnaire that was given to students to elicit feedback on their learning experience.

TEACHING AND LEARNING DESIGN FRAMEWORK

A generic teaching and learning framework has been proposed by Oliver & Herrington (2001) and this framework is heavily influenced by their belief that constructivism best describes how learning takes place. It comprises three critical elements, these being: learning resources (content); learning tasks; and learning supports as shown in figure 1.

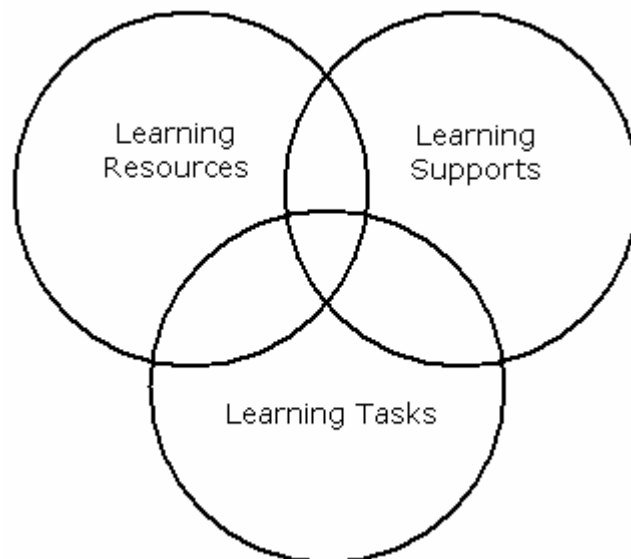


Figure 1: Generic Teaching and Learning Framework

Learning resources provide the content for a course and can be thought of as the materials which are used to help students construct their knowledge and meaning with respect to a domain of knowledge. Traditionally these resources have been available in the form of books and lecture notes and the move to flexible technology based systems has led to large amounts of content being made available electronically, for example on the web.

Learning tasks are the second element of the instructional design framework and play a fundamental role in determining learning outcomes (Wild & Quinn, 1997). The tasks determine how learners engage with the various materials and well designed activities should be active and engaging.

Learning supports are the third element of the instructional design framework and can be thought of as the supports required to help guide and provide feedback to learners in a way that is responsive and sensitive to learner individual needs (McLoughlin & Oliver, 1998). In 'traditional' settings such supports have been provided by actively involved teachers (Laurillard, 1993) whereas in technology based learning environments, such supports are often known as 'scaffolds' to help learners during their knowledge construction process (Roehler, 1996).

As can be seen in figure 1, the three areas of the framework overlap. For example, an on-line tutorial might be considered a resource and yet is also a task that a student might have to complete.

WEB COMMERCE DEVELOPMENT UNIT STRUCTURE

Cognitive Load Theory

The unit was designed with reference to the framework of figure 1 and also with the aim of keeping a manageable cognitive load for students, especially those with little or no technical background. Cognitive load theory is built upon the idea that working memory is limited to around seven chunks of material (Miller, 1956) and that people can only deal with two or three elements simultaneously. Cognitive load can be considered to comprise of intrinsic and extraneous elements. The intrinsic cognitive load is determined by the perceived difficulty of the body of knowledge to be learnt (Chandler & Sweller, 1996). The extraneous cognitive load is generated by the instructional format used in the teaching and learning process and poor design leads to a high extraneous cognitive load. If a high extraneous cognitive load is combined with a high intrinsic cognitive load then this can lead to working memory overload.

The important point is that when the intrinsic cognitive load of the material is high, then it is incumbent on the instructional designer to think very carefully and ensure that the extraneous cognitive load is as low as possible. In the case of 'Web Commerce Development', the intrinsic cognitive load is considered high, particularly by non-technical students, and it was therefore necessary to be very mindful of this in the selection and design of the learning resources, supports and tasks.

Unit Design

The unit's aim is to introduce students to a wide range of technologies that developers of web-based business systems would be expected to have knowledge of and utilise in their workplace. It is recognised that many of the students who are taking the unit will not themselves be developers, however they may well go out into the workforce and have to interface with such developers and be able to have some common understanding of the concepts and technical jargon that might be used.

The teaching and learning process for the unit comprises one two-hour lecture and one one-hour computer laboratory per week, over a thirteen week period. The lecture however is utilised as more of a seminar. The assessment comprises two assignments and one exam.

The first six modules of the unit outline are reproduced in table 1 in order to give the reader a feel for the unit's content and perhaps to demonstrate why it is necessary to keep the extraneous cognitive load at a reasonably low level.

Table 1: Modules 1 to 6: Web Commerce Development Unit

1	Web-based systems development lifecycle (SDLC)
2	Functional Architecture. Information Architecture.
3	The technology of web based systems: Hypertext markup language (HTML), Dynamic HTML (DHTML)
4	Extensible Markup Language (XML). EXtensible HyperText Markup Language (XHTML)
5	The technology of web based systems - client-side processing: Java, JavaScript and VBScript, ActiveX data objects.
6	The technology of web based systems - server-side processing: Common Gateway Interface (CGI), Active Server Page (ASP), Java Server Page (JSP), PHP scripting language.

Learning Resources

Because the aim of the unit is for students to gain an awareness of the various technologies, it was very difficult to find a textbook to recommend for the unit. Most texts went into too much depth in the various technologies, and it was therefore decided that this important learning resource should be a Reader made up of journal articles, tutorial materials, and any other appropriate materials. This important learning resource forms the basis of the weekly lectures / seminars.

Other resources that are used in the unit were mainly web based. It is necessary for students to search for and synthesise various materials in order to do the learning tasks that are given to them.

Learning Tasks

The tasks are probably the most important aspect of the learning framework as they ensure that students actively engage with resources in order to complete the tasks. However, it is well known that getting students to apply themselves to tasks is not always a straightforward process. In many units, student engagement with resources occurs just before assignment hand-in dates and just before examinations.

The Reader is used as the basis for the weekly seminars and there is an expectation that students should have read the relevant papers before attending the seminars. Weekly question sheets are produced that are made available to the students one week before each seminar. Space is available on the sheets for students to fill-in their answers and this makes it easier for the lecturer to determine who has carried out the prior reading. Students seem to like this system as the questions direct them to the important aspects of the papers.

This unit was designed with the aim of getting students to engage with resources continuously throughout the semester and to collaborate with other students. To this end, weekly tasks are assigned that have to be done in groups of three students. Each task is fairly open ended, an example is:

Find an interesting article or web site that adds to our knowledge concerning XML and / or XHTML etc. This might, for example, be an interesting case study. Describe how the article / web site adds to our knowledge.

Each student group has to produce an answer in about 250 words and then post it to a discussion board within the university's content management system, BlackBoard (2004). Each group also has to look at other groups' postings and make a meaningful addition to one such posting each week. Such additions have to be about 100 words in length. In order to ensure that the students attempt all of the weekly tasks, the postings and responses that they make are the basis of their first assignment.

A problem that instructors have when assessing such discussion board postings include: the excessive time that it takes for the instructor to mark all such postings and responses; and the difficulty of finding the postings and responses for a particular student group within the discussion board system. In an attempt to overcome these two problems, the following is done: only a selection of student postings and responses are marked; and students are required to collate all of their postings and responses in a freeware program called NoteCenter (2004). An example of a NoteCenter file handed in by students is shown in figure 2.

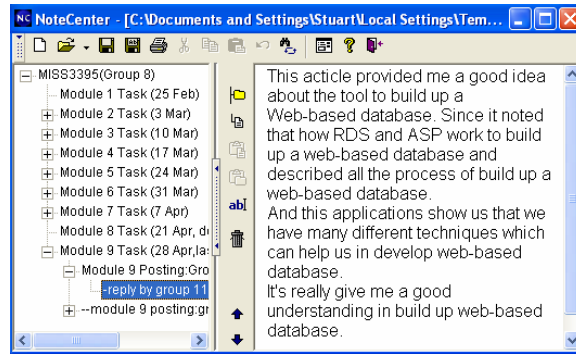


Figure 2: NoteCentre File of Postings

Having a student groups' postings in such a file makes it very straightforward to assess.

The second assignment is the other major learning task that students have to complete. This is again done in groups in order to encourage collaboration. In this task, the students have to build an e-commerce web site for a real or fictitious business. Such web sites allow purchasers to browse catalogues of goods and services, select products and finalise purchases. One of the best known e-commerce sites is that of the online bookseller, Amazon (2004).

Collaboration is encouraged with this second task as students have to work together in the analysis, design and implementation of the e-commerce sites. The student groups usually contain a mix of information systems and marketing students, and this helps students gain both technical and creative design knowledge from each other. Further collaboration takes place between groups as the e-commerce sites are uploaded to a web server, allowing a groups' e-commerce system to be used by other student groups. Dummy orders can be placed to check the functionality of the systems that have been created.

Learning Supports

In order to succeed with the assigned learning tasks, students have to use learning resources. However, as in all learning, there are times when students need help or advice and this is where the third part of the framework, learning supports, is utilised. In this unit, the most widely used learning support is provided by other students. This occurs within the student groups, with students supporting each other, and also between groups. Examples of the latter include: the replies that student groups have to make to the main weekly postings of other student groups; and the feedback given when groups use other groups' e-commerce sites.

Of course in most units of study, support is frequently obtained from the instructor. However, it is pleasing to report that little help is requested from the instructor for this unit. Because of the way in which collaboration has been encouraged, students gain most support from each other.

The content management tool Blackboard (2004) is used for this unit with resources, tasks and supports being made available. The learning supports on the web site include: regular announcements concerning the unit; a list of 'frequently asked questions'; electronic movies which show certain 'difficult' procedures such as uploading a web site to a web server.

EVALUATION AND REFLECTION

At the end of the semester, students were requested to fill-out an on-line questionnaire for the unit. Twenty-six students completed the questionnaire and the data was analysed so that improvements could be made to the unit where necessary. The findings are described and discussed below.

Finding 1: Most students prefer to work in groups

Working in groups often causes problems for students. There are the difficulties associated with group dynamics and students often comment that others in their group are not doing their fair share of work. However, as can be seen in figure 3, there was overwhelming support for working in groups.

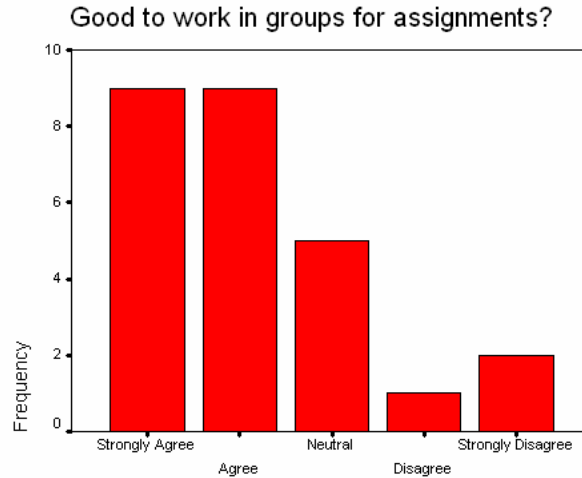


Figure 3: Student Responses to Working in Groups

Anecdotal evidence suggested that some older students were not as happy working in groups and so the data was analysed to determine if there was a difference between younger and older students. Younger students and older students were classified as being 24 or under, and 25 or over, respectively. There were 16 younger students and 10 older students in the survey. A t-test was carried out and it was determined that there was a significant difference ($t(24) = -2.08, p < 0.05$) with older students being less supportive of working in groups. A typical comment made in the survey from an older student was:

Work input was never equal. Different level of commitment among group members. I want to do as well as I can. Others don't mind anything or some just want to pass.

Finding 2: Most students prefer to have weekly tasks

The author was concerned that requiring student groups to carry out a weekly task and also respond to other groups' postings might be considered a burden for some students. However the survey findings shown in figure 4 clearly indicate that students preferred this format than being required to complete a single large assignment.



Figure 4: Student Responses to Completing many Tasks for Assignment 1

Two comments made by students were:

It allows the students to show initiative and promotes ongoing work in the unit - helps increase the learning. Great idea!!

Having many tasks allows you to work on certain areas at a time which is of greater benefit to my learning. Having one large assignment forces the focus onto many different disciplines making it harder to retain information on any particular subject.

Finding 3: The majority of students would not have completed all tasks if they had not been assessed

Although students indicated that completing many small tasks for their assignment 1 was very useful for their learning, the question arose as to whether they would have been motivated to attempt all the tasks if the tasks were not part of an assessment. Most instructors know that it is quite difficult to get students to complete unassessed work and the responses to a question concerning this are shown in figure 5.

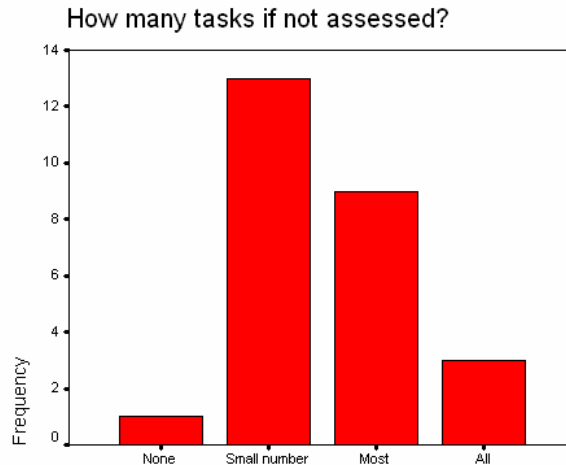


Figure 5: Student Responses to Completing tasks if not assessed

As can be seen from the figure, the majority of students indicated that they would only have completed a small number of the tasks and this has helped confirm the need for tasks to be formally assessed.

Finding 4: Viewing and responding to other postings helped my learning

Educational theory suggests that collaboration and engagement with other students improves student learning and a specific question concerning the viewing of, and responding to, other groups' postings was asked. The results are shown in figure 6 and they support the view that the educational experience has proved useful.

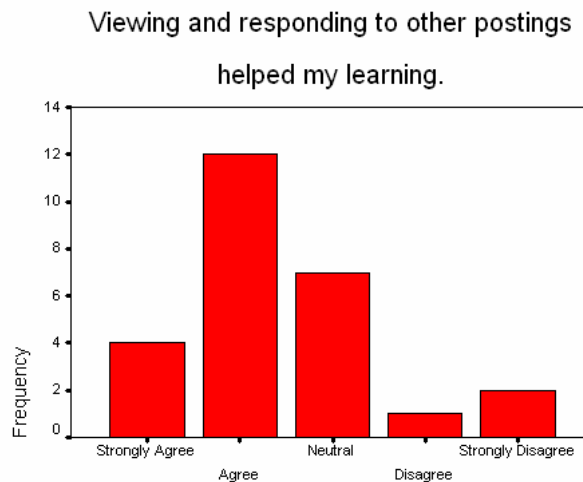


Figure 6: Viewing and responding to other groups' postings

Finding 5: Creating an on-line shop helped me understand the technologies involved

In the second assignment, students have to analyse, design and implement an e-commerce web site by using specialist 'shopping cart' software. To the non-IS students, this is often initially daunting. However, the author has always believed that in order to gain a deeper understanding of such technologies then it is

necessary to actually engage with and be heavily involved in the complete development process. The student responses shown in figure 7 support this view.

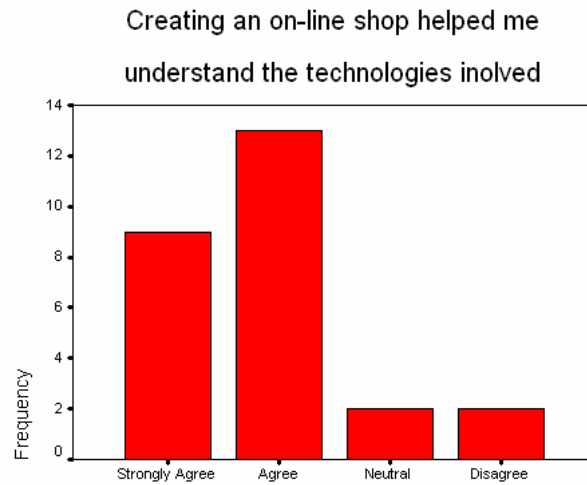


Figure 7: Creation of an Online e-commerce web site

Finding 6: Students with extensive ICT (Information and Communications Technology) experience found the unit easier

There were mixed views from the students on the degree of difficulty of the unit and these are reflected in figure 8.

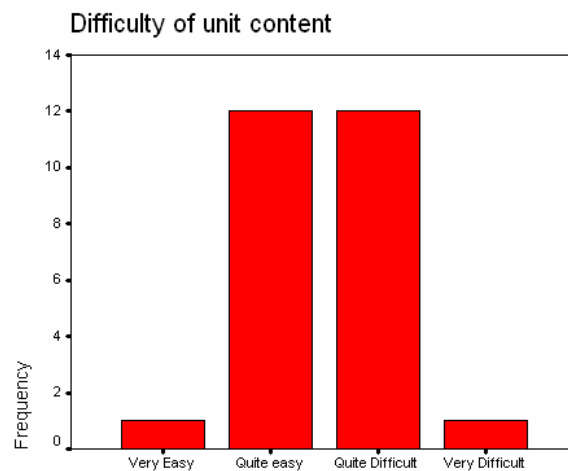


Figure 8: Difficulty of unit content

As can be seen, the numbers are equal between those who thought the unit was 'quite easy' and 'quite difficult'. It was gratifying to note that only 1 student believed the unit to be 'very easy' and another student who believed it to be 'very difficult'.

T-tests were carried out to determine the type of student who thought the unit was 'quite easy'. The result that was significant was that students with extensive ICT experience, who were mainly IS students, found

the unit relatively easy ($t(24) = 2.66, p < 0.05$). This result was to be expected but the graph does suggest that the content and tasks were about the correct level of difficulty for both non-IS and IS students to have a useful learning experience.

CONCLUSIONS

This paper has discussed the design and evaluation of a technical e-business unit. The design has been informed by a generic learning framework and the emphasis has been to encourage student engagement with both learning resources and fellow students. The results from a questionnaire suggest that the unit is a success with most students: enjoying working in groups; preferring to carry out weekly tasks; and finding that engaging with other groups' discussion board postings helped their learning.

The difficulty of the contents has been a compromise in order to provide a useful learning experience to both technical and non-technical students. There has been concern voiced by a small number of mature students in connection with group work. Mature students are more likely to want to achieve higher grades than some younger students and they believe that this is best done by working individually. It is unclear how their wishes can be met but perhaps the best approach would be to discuss with students, at the beginning of a semester, the reasons why group work is encouraged. In addition, students can be required to stipulate the contributions made by themselves, and the other students within their group, so that grades can be adjusted accordingly.

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Gibson, B. Edith Cowan University, Australia. Establishing A Degree Program Involving The University And A Corporate Body As A Partner

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ABSTRACT

The School of Biomedical and Sports Science at Edith Cowan University has recently established the new Bachelor of Science (Paramedical Science) degree. The program is a joint initiative between Edith Cowan University and St. John Ambulance and is the only Paramedical degree of this type being taught within Western Australia.

In preparing the graduates to work in the profession as qualified paramedics, it was essential to integrate the theoretical content taught by both the university and the ambulance corporation with significant practical experiences being delivered in the ambulance and hospital environments.

The implications for this type of arrangement have been far reaching, as it involved the combining of the university resources with a corporate provider who had previously been involved in an education program in the TAFE system. Having a significant section of the degree taught and serviced by a corporate provider from outside the university meant that considerable planning had to be undertaken to protect the university, the corporate provider and the students who were enrolling in the new paramedical degree.

Other considerations in establishing this initiative were the risk factors that occur because of the nature of the work in a medical discipline. During the three years of their training the students are also working in the ambulance service as trainees alongside qualified paramedics and are involved in the full spectrum of emergencies.

The complexity of these arrangements and possible ramifications meant it was imperative that a carefully constructed legal contract be established between the university and the corporate provider. This was necessary to ensure that the interests of the major stake-holders were covered at all times, while still maintaining the quality of the program. This process involved considerable costs in terms of finance and time while an agreement was reached which satisfied both the university and the corporate partner.

The major issues which needed to be covered in the legal agreement included:

- the ownership of the intellectual property,
- cost sharing arrangements between the university and the corporate partner,
- quality control of all aspects of the program,
- staffing implications for units taught outside the university,
- legal liability associated with all aspects of conducting the program,
- adherence to occupational safety and health standards,
- duty of care for both patients and the trainee paramedics,
- ownership of the program.

While the development of this program has been an exciting challenge for all concerned, there was no template or guide to follow within the university system and this is the first time that the university has entered into an arrangement where a partner from the community has had such a significant input into a

teaching program. The resultant agreement has provided a guide for others who may wish to establish similar partnerships in the future.

Although this degree is still in the early stages of delivery, the effort that has gone into the careful development of this partnership has resulted in a smooth introduction into the university sector and all indications are that students are experiencing a quality program delivered by the university in conjunction with its corporate partner.

INTRODUCTION

A strongly held view in Australia is that while the universities have been effective performers of high quality research and teaching there has been a shortfall in terms of converting the ideas to marketable products and processes (Australian Vice Chancellors' Committee, AVCC, 2004). Similar comments are common place in the United Kingdom where the government has put in place a number of measures to change this situation (Lambert Review, 2003).

This paper looks first at recent research that has been carried out reviewing partnerships undertaken by universities with community groups and corporations, and then reviews a new initiative that has been undertaken at Edith Cowan University (ECU) where a School has entered into a partnership agreement with a corporate body to provide a degree program that is specifically designed to meet the partners requirements. The teaching of this new degree commenced in 2004 with an intake of thirty first year students. While this partnership is unique for ECU there are numerous situations reported in the literature where partnerships between universities and the community have been established for research and business purposes.

University – community partnerships have had mixed success, with failures sometimes occurring due to difficulties experienced through a lack of a sound understanding of each others structures and systems. Maurrasse (2001) in an extensive study of the collaboration between American universities and the communities concluded that partnerships have not been perfected because of the failure of the communities to improve collaboration amongst their major participants and the failure of the universities to make institutional changes enabling them to adapt to community collaboration. Maurrasse also indicates that it important to realise that universities have a significant amount to learn about partnerships. He goes onto say:

In their daily lives academics are usually not expected to know how to build relationships in communities. Despite their particular expertise, they know very little about working at the community. Many higher educational institutions need to develop training programs if they are going to venture out into the community. (p.344)

The AVCC's report (2004, p.54), lists the following two issues that have been put forward by industry stakeholders regarding the problems and difficulties associated with entering into commercial agreements with universities: first, issues internal to industry that effect the industry's ability to enter into commercialization relationships with universities, and second, issues relating to university behaviour.

The AVCC's report (2004) also cites the needs and contributions that the partners should keep in mind when entering into a commercial venture. These include the following:

1. A knowledge of what is going on at the cutting edge.
2. The ability to add value to Intellectual Property and to market it in an appropriate form.
3. The need for partners to have an understanding of commercial realities.

4. The requirement for partners to have the authority to make decisions in a timely fashion and maintain confidentiality.

The key point that emerges from the five case studies cited in the AVCC's report (2004) indicates that while there is no ideal structure for the corporate and university relationship in partnerships, there are common features of behaviour for success. These are: (a) the need for co-operation between parties, (b) the acknowledgement of the diverse skills each party has to offer, (c) shared focus on getting the deals done, and (d) technical competence of both partners.

The Department of Transport and Regional Services (2004) position paper, provides an excellent summary of the benefits that can be gained by linking the universities into partnerships with community organisations. The universities provide the opportunities that are created from university-based knowledge, teaching and learning. The universities can also support local creativity and assist with embedding learning into the wider community.

The research findings from this paper demonstrate that when communities and universities work together, the effects can far exceed individual efforts and the outcomes can be beneficial to both groups. The Department of Transport and Regional Services (2004) refers to this style of working together as "good practice" and provides the following definition of good practice:

Good practice in engagement means a relationship involving mutual learning and knowledge exchange, where roles and expectations coincide, and which addresses objectives that are important both locally and institutionally. (p.1)

Molas-Gallart, Salter, Patel, Scott and Duran (2002, p.3) refer to the universities as having been founded principally on two sets of activities, teaching and research. Universities however, have been noted for making contributions either directly or indirectly, to decision making in the wider society. This is termed the "Third Mission or Third Stream". Third stream activities are therefore concerned with the generation, use, application and exploitation of knowledge and other university capabilities outside academic environments.

A comprehensive review of successful collaborative partnerships has been researched by Foster-Fishman, Berkowitz, Lounsbury, Jacobson and Allen (2001). From their findings the authors suggest that coalitions need collaborative capacity at the following four critical levels: (a) within their members, (b) within their relationships, (c) within their organizational structure, and (d) within the programs they sponsor.

Foster – Fishman et al. (2001) refer to enhancing the collaborative capacity by first developing members' skills/knowledge with regard to how to work together and then second, by developing skills and knowledge to become creative program builders. Wandersman, Goodram and Butterfloss (1997) emphasise that one cannot underestimate the importance of the membership. They indicate that a coalition's membership is widely regarded as the primary asset. There is no doubt that experience demonstrates that successful collaboration capacity is greatly influenced by existing skill/knowledge together with the attitudes that are made by the participating collaborates to grow, support and utilise this capacity.

The importance of the skills/knowledge of the membership of a community-university partnership was reinforced in a study that was undertaken recently in Canada involving the field work experiences of Occupational Therapists. Banks (2004), in describing their project says,

We began our community development process with an identification of the strengths, weaknesses, skills and general goals of each community agent as well as a commitment to collaborative work. Together we used models of community development, occupational therapy and client centred practice to negotiate and plan a course of action. (p.2)

An earlier study by Essex (2001) also researched effective partnerships and recommended that effective and successful partnerships must have:

1. A clearly defined purpose and direction.
2. Enthusiastic endorsement by top level leaders.
3. Trust amongst partners.
4. Open communication.
5. Mutual respect amongst partners.
6. Tangible benefits for all partners involved.
7. Mechanisms to assess progress and measure outcomes.

Maurrasse (2001) summarises the factors that influenced the nature of higher education/community partnerships in the USA as: (a) the type of institution of higher education, (b) the historical relationship between the partners, (c) power relationships between the institution and the community, (d) the availability of external funding, (e) the relative support of the public sector, (f) the governing structures and (g) the background and experience of the representatives of the two partners.

When discussing how improvements can occur in partnerships Maurrasse (2001, p.346) cites the findings of the May 2000 Santa Barbara conference, “A dialogue on Partnerships”, and lists the following as critical issues for successful partnerships: the need to address the power dynamics, consistency and longevity of partnerships, effective communication, greater exchange of knowledge, clear and institutionalised incentives and reward systems, and good public relations to enhance the profile and growth of the partnerships.

The results that have been presented in the literature have clearly outlined the essential factors that need to be addressed in establishing collaboration between universities and corporate partners correspond throughout the various studies. It is apparent that in a number of case studies attention has not been given to ensuring that all the steps have been followed in the partnerships. However there are also numerous cases cited where very successful partnerships have been established and the outcomes have been beneficial to both the university and the corporate partner. The literature has provided a comprehensive summary of the direction that needs to be followed in the process of establishing partnerships.

The following case study of the establishment of the partnership between Edith Cowan University (ECU) and the St. John Ambulance Association (SJAA) involved the bringing together of a university and a corporate body from the community and illustrates many of the principles that have been discussed in the review of recent research into this area.

DEVELOPING THE PARTNERSHIP: PLANNING AND DESIGNING THE DEGREE

In 2003 the School of Biomedical and Sports Science was approached by SJAA with the view to designing and conducting a paramedical degree in conjunction with their organisation. The qualification is a Bachelor of Science (Paramedical Science) degree, specifically designed to train paramedics who would work in the SJAA system. Due to the nature of the material that was required in both the theoretical and practical areas it was evident from the outset that this initiative would require both organisations to work in partnership in the preparation and delivery of the program.

Prior to the development and introduction of this degree, paramedics in their training completed an Associate Diploma of Pre-Hospital Care. This involved one year of part-time study at Technical and Further Education (TAFE) followed by a further three years of part-time study at the St John Ambulance College.

The new paramedical degree at ECU follows the normal degree structure of twenty four units and is designed to be completed in three years full-time study or part-time equivalent. A significant difference in this program from the more conventional ECU degree is that the degree does not involve a minor or supporting major, the total 24 units are all compulsory. The students entering the course complete the eight first year units on a full-time basis at the university. After successfully completing these units they move into the second year of the program and are employed by SJAA as full time student ambulance officers. In the second and third year of their program the students are given “block time release” which involves ten weeks in each semester to undertake concentrated full-time study, free of the responsibilities of their ambulance work.

The challenge facing the personnel developing the university course was to include the materials from both ECU and SJAA that would prepare graduates to work in the profession as qualified paramedics at the end of three years. It was also important to ensure that the level of materials put forward in the units were of university standard, as previous awards for the preparation of paramedics had not been set at that level. The design of the curriculum was made more complicated given that it had to include compulsory material as set out by the Ambulance Training Centre (2003); Australian National Training Authority (2004); Convention of Ambulance Authorities in Australia and New Zealand (2001) and Jacobs (2004).

Because of the nature of the content that was required for the training of the paramedics it became evident in the early stages of development that it would be opportune to include input from the School of Biomedical and Sports Science and the School of Nursing and Public Health.

The involvement of SJAA in the delivery of units provided a wealth of practical experience in the field, as their organisation was already well established in terms of equipment and facilities, and they had the relevant contacts in the various medical regions. On the other hand, ECU had well qualified staff and excellent facilities which would enable them to deliver a number of science based units throughout the degree.

Selection Process for Students entering the Paramedical Degree

Because of the special criteria that SJAA require of their paramedics, the selection process differs from the normal pathways that students undertake to gain admission to ECU.

The initial difference is that the students are required to have a minimum of three years experience in the workforce prior to entering the paramedical degree. It is believed that the experience gained by working in the community and dealing with people in the workplace gives them added maturity to adjust to some of the traumatic situations that they will face as a paramedic. The second difference is that they have to undergo an additional process of tests and interviews, which are not part of the normal university entry process.

The entry process begins with SJAA advertising for prospective paramedical students. In addition to satisfying the university admission requirements in order to qualify for consideration, candidates must have a: (a) current St John Senior First Aid Certificate, (b) Western Australian ‘C’ Class Drivers Licence and a good driving record and (c) current police clearance.

They must also have: (a) excellent written and verbal communications, (b) initiative, confidence and a commitment to learn, (c) a genuine desire to care for people in need and (d) computer literacy.

Those applicants that meet the initial criteria are put through a series of psychological tests at the SJAA centre. These tests are designed to identify those who react favourably in group interactions, can display the individual attributes required for team work and finally are able to demonstrate potential leadership qualities. After the initial testing, the group is reduced to seventy and these individuals are then required to undergo a series of interviews before a panel in order to assess their ability to work in the paramedical environment. They are then ranked and the list of successful applicants is forwarded to the university to complete the admission process.

LEGAL AGREEMENTS BETWEEN THE UNIVERSITY AND CORPORATE PARTNER

There were two aspects of this degree program that highlighted the need for a legal agreement to be established between ECU and SJAA. The first aspect was that St John would be involved in the delivery of a significant amount of the content material. The second was that students would become employees of SJAA after successfully completing the first year of their degree. This meant that as ECU students they are working alongside qualified paramedics and would be involved in the full spectrum of emergencies.

The complexity of this arrangement with the students studying full-time while being employed by SJAA and working in a high risk area involving a medical discipline, necessitated that a carefully constructed legal agreement needed to be drawn up. The process of drawing up the legal agreement was expensive in terms of both financial costs and time and included considerable negotiations between the staff of the two organisations and secondly between the two legal firms representing ECU and SJAA. This legal agreement has however provided protection for the university, the corporate partner and the students undertaking the degree.

Legal Aspects and Issues

The following are the major issues that were covered in the legal agreement:

- **Ownership of the degree**
ECU is the body conferring the degree and is therefore totally responsible for the organisation, administration and ownership of the course.
- **Quality Control of the degree**
The University is responsible for the quality control of the degree. All areas associated with the delivery of the materials must be monitored by the School of Biomedical and Sports Science. These include major aspects such as unit outlines, teaching materials, examinations and assessments, facilities and staffing. It is essential that all of these matters are conducted and managed in accordance with ECU's policies and procedures.
- **Financial Arrangements**
All units are Higher Education Contribution Scheme (HECS) based units and the monies will be received by Edith Cowan University. Where the corporate partner is involved in the teaching of units in the program, the university will pay for their services on a sessional basis per unit taught. SJAA will invoice the university on a monthly basis for this service and payment will not be made to individual SJAA staff.
- **Staffing**
The staffing of the units taught by SJAA is an issue that needs to be monitored continually to ensure this aspect of quality control is maintained. It is a requirement by ECU that SJAA submit CV's for all

staff involved in the teaching of their part of the degree. The Head of School accepts responsibility for assessing the appropriateness of these staff with respect to qualifications and teaching experience. All staff and students working in the university are required to adhere to ECU policies, laws and directions. To ensure that the SJAA are able to adhere to these policies ECU has an obligation to provide any assistance that is required to assist SJAA in carrying out its services. This assistance is to be ongoing.

In addition, the School of Biomedical and Sports Science provides a very comprehensive orientation and induction program for all new staff. This will now be extended to the St John Ambulance staff involved in teaching their units.

- **Representatives, key people and employees**

In order to ensure that constant communications and interaction takes place between the university and the corporate partner it is a requirement that each party nominate at least one representative to be responsible for the day to day administration of the agreement. In the case of ECU, the representative will also be responsible for the day to day delivery of the Professional Services and supervision of SJAA in providing the services. The ultimate responsibility for the program will however rest with the Head of School at the university.

- **Insurance**

Being a degree that aligns with the medical profession there is high risk associated with the profession and the services it provides. The structure of the degree together with the involvement of the university and a corporate partner could lead to complications in terms of legal liability. This issue is important should the occasion arise where legal action is taken against students while carrying out their duties as a student ambulance officer, given that they are ECU students during this training.

The agreement has outlined the requirement to overcome problems that may arise as a result of legal action by a patient, and more specifically to protect the university should this occur. SJAA must arrange and maintain insurances with an authorised insurer and provide workers compensation to cover maximum liability. They must provide for personal accident insurance and professional indemnity for persons employed by SJAA.

The aspect of insurance was a critical issue in the legal agreement and it was particularly important to ensure that the University was protected against any claims that may occur with the students while they were also working SJAA.

- **Intellectual Property**

It is written into the University rules and regulations that all teaching materials prepared and used for teaching purposes remains the property of the university. Because twelve of the units are prepared and serviced by St John Ambulance in this program, special clauses had to be drawn up to recognise the input of St John Ambulance and the ownership of Intellectual Property. Therefore, it was agreed that all intellectual property subsisting in the course will rest with ECU, however SJAA has the option to retain ownership of all intellectual property SJAA has created.

- **Subcontracting**

Because of the variety of disciplines that are covered in the course the expertise is not always available within the organisations and it requires utilisation of individuals or companies outside ECU and SJAA. This can have ramifications in terms of quality control and the monitoring of input into the units. It has become necessary therefore, to write a clause into the agreement that ensures the controlling of any

sub-contracting. As a result, any sub-contracting that is to be carried out requires the written permission of the Head of School. Where the situation does arise, it is necessary for the sub-contractor to supply all details as required by ECU, and where SJAA are the sub-contracting body, they remain responsible for all costs incurred while ECU has the right to replace or remove the sub-contractor with reasonable notice.

While the legal agreement was difficult to formulate in terms of satisfying both major stakeholders, it was essential because of the complexity and uniqueness of the arrangement with SJAA.

THE ADVANTAGES AND DISADVANTAGES OF WORKING WITH A CORPORATE PARTNER

Advantages and benefits of working with a corporate partner

This is the first time that the School of Biomedical and Sports Science has been involved in this type of arrangement with a corporate partner. The initiative certainly aligns with the ECU strategic priorities 2003 – 2007 in that it engages with professions and professional life, builds partnership, pathways and precincts and strengthens enterprise and the resource base. It has also become apparent to those involved, that this arrangement has many advantages for both the university and the corporate partner and there is strong support for the program. These advantages can be summarised as follows:

1. It provides access to personnel, facilities and equipment that are not available within ECU.
2. The corporate partner's input and expertise minimises the cost of starting a new degree.
3. The School is now able to move into another Health related area.
4. The paramedical degree fully utilises staff skills and a number of units that we are already teaching in other degrees.
5. ECU and the School of Biomedical and Sports Science are given additional exposure in the corporate sector and this can only improve our image in other health related areas.
6. Provides further opportunities to other schools within the Faculty to gain experience working with a corporate partner.
7. Research opportunities have become apparent in a new area.
8. University staff have gained the opportunity to teach with specialists from another discipline outside the university.
9. ECU gains exposure in the corporate sector.
10. New initiatives are forthcoming to develop full fee paying post graduate awards.
11. The corporate partner is exposed to advanced technology and facilities within the ECU.
12. Consultancy and project opportunities are arising for both partners.
13. The potential to expand to an interstate and international market.
14. A cooperative spirit and trust has developed between the two organisations.

Disadvantages and difficulties of working with a Corporate Partner.

There will always be disadvantages and difficulties that arise when working with an organisation that differs from the university "culture". However partnerships should not be discouraged because of these

issues and it is important to put management practices in place to overcome them. These are some of the disadvantages and difficulties that have arisen during the time that the course has been running:

1. The two organisations are at different locations and this makes immediate communication between staff more difficult.
2. The two cultures, university and corporate, work in different ways and have different agendas in a number of instances.
3. Achieving a level of understanding and appreciation for each others requirements.
4. Students answering to two organisations, one being their employer and the other the university.
5. Confidentiality of what information should and should not be shared with the corporate partner. Example – student details and results.
6. Understanding commensurate academic standards with regard to teaching, staffing and academic procedures.
7. Problems of timetabling the units that are being taught on and off the ECU campuses.
8. Reaching agreement on Recognised Prior Learning (RPL) and recognition of previous awards for exemption purposes.

POSITION OF THE PROGRAM IN 2004/2005

The first intake occurred at the beginning of 2004 and 30 students have been accepted on a full-time basis into the degree. In the first year these students will have completed eight units, seven of which are taught by ECU staff in conjunction with ECU's Human Biology degree and one which is taught by SJAA. Because the programme is full-time, the students have been able to devote all their energies to their study programme and the issues have been minimal.

At the conclusion of 2004, those students who have successfully completed the first year of the degree programme will commence as employees of SJAA and will combine full-time work with their study. This is a different concept whereby the student ambulance officers will work on the road for a period of time and be given a break of 10 weeks for full-time study – termed “block residential” where they attend classes at SJAA and ECU and cover the content of their semester units during that period. This will occur during each semester.

A second approach will be adopted by the ECU and SJAA to overcome the difficulties associated with the students being full-time employees. This approach will involve placing the units ‘on line’ and thus enabling more opportunity for independent study to be undertaken. In 2005 students will move into the second year of their degree and it will be necessary to ensure that the processes and programs, unit materials, examinations, student progress, staffing and teaching are all carefully monitored and documented for quality control.

CONCLUSION

While the development of this partnership with a corporate body is in the early stages it is believed that the processes that have been undertaken have included many of the essential elements of collaboration identified in the research literature (Australian Vice Chancellors' Committee, 2004; Banks, 2004; Essex, 2001; Foster – Fisherman et al. 2001; Malas-Gallart et al. 2004; Maurrasse, 2001). The processes must remain on-going and flexible and the successful outcome of the exercise will be dependant on constant communication and the ability of both groups to sensibly discuss and solve the issues as they arise. Partnerships take a long time to develop. A number of discussions and trust – building activities are necessary.

The representative stakeholders have spent an extensive amount of time establishing the degree structure and making readjustments to ensure that it is a quality program conducted in a unique framework, being different from the traditional degrees taught solely by ECU staff.

A mutual respect has developed between the two partners and this has resulted in an increased appreciation and understanding of each others needs. All indications at this stage are that students are experiencing a quality program delivered by both the university and a corporate partner.

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Guilfoyle, A., and Halse A. Edith Cowan University, Australia. Community, Diversity, Quality, Learning and Planning: Exploring International Postgraduate Students' Transition Experiences

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ABSTRACT

The Australian government increasingly recognizes international education as essential for sustainability and growth of Australian higher education (e.g., McGuaran, 2003). Though smaller in proportion to undergraduate numbers, international postgraduate students occupy a critical space in the outcomes bound to extending international links. These students will occupy positions of status within their home communities and 'represent' their host University. Optimizing their study experiences provides scope for benefits received by the host nation, the student and future development of intercultural exchange and co-operation. However, international students are likely to feel any effects of transition issues more sharply than domestic students and so it is important to investigate carefully the dimensions which positively and negatively affect their experiences, engagement and learning. In this study we extend previous literature on student transition that focuses on domestic undergraduates, into the realm of international postgraduate education. Based on the results of a series of University-wide Student Experience Surveys, we conducted in-depth interviews (N = 23) with a sub-sample representation of international postgraduate students. The analysis draws on Doise's (1986) levels of social-psychological analysis and charts the student experiences in detail across four levels of relationship with the host University, including the intra-personal, inter-personal, intergroup and societal. Findings and discussion highlight areas of transference to applied topics such as, issues in cross-cultural teaching and assessment, peer interactions, factors affecting quality supervision and sites for future planning as a shared responsibility.

INTRODUCTION

In an earlier paper we have argued that research on transition is an important framework in understanding the dimensions of international postgraduate (IP) student experiences and these interact with institutional services (Guilfoyle & Halse, 2004). This work charted a conceptual framework for understanding IP student transitions borrowing from Doise's (1986) levels of social psychological analysis. These levels include the intrapersonal (relating to within the person); the interpersonal (interpersonal relationships between the individual and others); the intergroup (relating to how the person is affected by their own or others' group memberships) and the societal (how broader social factors shape experiences). In the current paper we add evidence from interviews with IP students to support this framework. The analysis draws conclusions about how transition experiences of IP students work together with some of the social benefits that are rhetorically attached to IP enrolments including, learning, community and diversity. We discuss these concepts in light of institutions responsibilities to plan services that optimise 'quality' IP experiences.

Guilfoyle and Halse (2004) cite the clear economic advantages in IP student intakes (to the host nation and institution) (Australian Bureau of Statistics, 2002; Burns, 1991; Harris & Jarret, 1990; IDP Education Australia, 2002; Nelson, 2002, 2003; Pokarier & Ridings, 1998). However for many authors these economic claims are too often non problematically juxtaposed against rhetorical claims about the social benefits accrued from hosting IP students (for host, nation and student) (Ryan & Twibell, 2000; Stier, 2003). There is no doubt an important recursive loop where optimising social outcomes makes future economic gains more likely (Australian Bureau of Statistics, 2002; Bohm, 2003; McGauran, 2003; Mullins et al., 1995; McInnis, 2001). The problem is that social benefits are often not clearly explicated and evidenced.

Guilfoyle and Halse posit transition research as a useful framework for applied social analysis to identify the dimensions of IP student experiences and any barriers, or pathways to social exchange that occur within these experiences. Ballard and Clanchy (1997) define transition as a process of socialisation into the university culture where rules are not explicitly stated. Evans (2000); Hellesten (2002); Ryan & Twibell (2000) all refer to transition of students specifically as adjustments to a new, unfamiliar environment and learning context. Transition affects all students; especially the first year is stressful, socially isolating and disappointing (Burns, 1991; Ying, 2002). However for the international student pressures of successful transition increase (Mullins, Quintrell & Hancock, 1995). Guilfoyle and Halse (2004) have therefore extended transition research into the context of international - postgraduate students.

IP students are a special case for transition research for several reasons. First, they represent a growing market within the strategic aims of Australian universities. Australia's Department of Education, Science and Training (2004) and IDP Marketing and Research (2004) highlight the profound increase in postgraduate numbers. Indeed the national proportion of international students that are postgraduate has risen to 37.5% (IDP Education Australia, 2004); and this is outstripping undergraduate increases with generally large projected demand (Bohm, 2002). IP students are therefore an important site for applied social analysis. Second, the IP students are subject to a combination of two major processes known to affect transition – postgraduate study (Deem & Brehony, 2000; Volet & Ang, 1998; Wang, 2004) and cross-cultural adaptation (Church, 1982; Felix & Lawson, 1994; Ingleton & Cadman, 2000). Third, IP students are 'socio-politically' different to their undergraduate counterparts. They are often older, arrive with or leave their own children/families, depart from well paid positions and status, previously have attained high levels of academic performance and accrued well developed expectations and learning styles. Finally, while many call for university specific investigations; there is a paucity of transition research that has examined the effects of improving support for international students generally, and IP students' transition specifically. Past research has taken the form of limited questionnaires by the host university focusing on academic performance (Volet & Renshaw, 1995). While some university based surveys index satisfaction or dissatisfaction with services, they do not explore the underlying mechanisms for these nor do they explicate how social exchanges are contingent on services (Guilfoyle, 2004).

Below we provide an analysis of data from interviews with IP students. We map IP students' expressed experiences in the context of transition literature (Guilfoyle & Halse, 2004)¹ to more precisely understand how services (their presence or lack of) impact on successful transition and the acclaimed outcomes of hosting IP students. In the space provided we focus on three aspects of IP students experiences – in particular speech referencing the supervisor as a link to learning; talk about the need to network with other professionals as a link to community and, concerns over the diversity in content of courses.

METHODS

Please note while this literature has guided the paper we do not reproduce it here (or in summary). Please refer to Guilfoyle & Halse (2004).

Design

The study was a Grounded Theory design (Strauss & Corbin, 1994) aimed at generating “substantive” knowledge about IP student experiences. We employed a semi-structured interview protocol where students conveyed their own “everyday understandings” of experiences as an IP student. The interview protocol was an evolving tool with an initial set of topics (expectations, orientation, what helped their experiences, what hindered these - see Guilfoyle & Halse, 2004) adapted to guide more focused observations arising from the ongoing data analysis. All interviews were conducted on campus on an individual (student basis) and one/two team members acted as interviewer for each session. Recruitment was conducted through a process of advertising on postgraduate lists and through snowballing (e.g., Guilfoyle & Hill, 2002; Henry, 1990). Volunteer participants contacted a central office, and were offered more information; including the anonymous nature of the research and withdrawal without prejudice. In the case of snowballing volunteers contacted the office or were invited to participate by previous interviewees/the researchers (and the same consent procedures then applied). Recruitment of interviewees was ongoing until saturation (Strauss & Corbin, 1994). Our analytical approach bracketed existing ideas and theories about the IP student experiences (Berg, 1989) and data were examined through an ongoing dialogue via “continuous interplay between data collection and analysis” (Strauss & Corbin, 1994, p.273) that characterises the constant comparative method. As the approach was team based; data was reviewed separately by team members with sections marked for transcription and brought together at team meetings for discussion. We present the data as a thick description including large segments of interview text and interpretative analysis under the following three analytical categories: Supervision, Professional knowledge, and Cultural relevance. Note, that in order to maintain privacy we have removed all names and references to country (and sometimes enrolment).

Sample

23 IP postgraduate students enrolled at Edith Cowan University in Perth Australia, participated in the study. The students were drawn from a range of cultural backgrounds including the nationalities of - Thailand, China, Norway, USA, UK, Indonesia, Malaysia, Malawi, Ghana, Zambia, Bangladesh, India, Argentina and, Seychelles). Also a range of schools including – Nursing and Public Health, Environmental Science, Business, Education, Psychology, and Performing Arts were included. Equal numbers of PhD (n=11) and Masters (n = 12) students were obtained however the sample was biased to female IP students (n=15) than male (n = 8). Average age of the participants was 34 years.

DATA ANALYSIS

Supervising Transition as Learning

A key component of motivation and learning for IP students we talked to was associated with the interpersonal relationship formed with their supervisor. Often students expressed a frustration that their own past learning and professional experiences were not well recognized by the teachers or supervisors. This was largely due to students’ expectations about interactions with supervisors framed in reference to their own past experiences.

Extract 1. Our supervisor is very dominant. I work as a teacher there 23 years. I was in the high position level 7 out of 11. In the class when we have argument about the portfolio he got to change, he put this, put this. Is not the same as we have in talk. Because the lecturer is very dominant, the student talk, talk, talk. They come across and when I raise my hand I’m like I’m confused. The lecturer told me shut up. So that is what happens. My friend is saying sorry to me. It is very hard to deal with. Very rude to you. They all accept that. It is extremely rude. The lecturer and the students miss out on the knowledge of your 23 years of teaching. Yes. But as a teacher if you are we the spirit of teacher you should not do like that. It is very worse. My experience of 23 years I have never told a student to shut up. So that what I understand that the personality. That is a barrier, so hard to deal with.

In light of Doise's (1986) levels of analysis, in the first extract, there are a range of negative intrapersonal affects being expressed as barriers to learning. All are contingent on the interrelationship with the supervisor. An extreme case no doubt, the student clearly expresses that his/her past experiences are neglected by the teacher. The important observations are that past experiences actively frame expectations about what form teaching should take and simultaneously the student argues that important societal learning rewards are excluded when these past experiences are neglected.

Extract 2. My supervisors but I don't blame them because they are very busy with their own students too. I'm not so sure whether it is the gap (?) that we have here or sometimes when we ask questions they will tell you oh well what do you think you find out for yourself. Okay my God I'm asking a question I need some kind of answer. Because sometimes being a student you feel very silly because I come from a background where I teach too but whenever my students they come to me I try to reason with them you see. What I think is that maybe what they need to be is a closer relationship. But of course I'm not so sure, people are busy, they don't have much time to spend with you. Or maybe it is the cultural difference. With my previous experience that I had when I was in the UK I had the same problem but those days it's not that bad because I had my friends. But now I am very alone and very vulnerable. And sometimes when I need help and I am going to the department they are not being helpful.

In Extract 2, interpersonal relationships are linked more closely with cross-cultural influences and learning. At the societal/intergroup level of learning style there is a clear difference between the student and supervisor approach to learning (self-directed versus dependent). With this left unchecked however the student is faced with an intrapersonal uncertainty about asking questions (an essential breakdown in good communication at the postgraduate supervision level!). This ends in an attribution about one's own self efficacy. The IP student is caught therefore in a 'gap' not knowing if this is attributable to self or a cultural divide. Another important feature of the talk (through the interviews) was the student's high cognisance of many of their own transition needs - including their vulnerability to isolation. Poor interpersonal relationships with key teachers, and cultural and learning style differences were seen as critical antecedents to isolation. Further, the students were also therefore aware of their own need for counteractive supports. IP students seemed attuned to the sorts of experiences they could expect and sorts of services that would mitigate these and were therefore sensitive to dissatisfaction. A final element was an important cross-cultural issue (raised particularly by our Asian participants) – the need for a closer relationship with the supervisor. Often this was expressed as an unresolved learning style conflict, dependent on cultural group origin, and societal values, acting as a barrier to effective learning.

Extract 3. The [name of country] style ideas, they don't ask the question. In our style when we have seniority, if you are young and have a meeting with the old you keep quiet. Because we avoid conflict. Sometimes what the lecturer want us to do we do it without asking. But the style here you don't understand you ask. But sometimes we don't know how to ask a question. The question is very difficult. We do very well when we are told what to do rather than creative thinking.

Many students expressed their concerns at the interpersonal level, often calling for (a cultural based) desire for a closer relationship with their supervisor. While the students were cognisant of the impact of learning styles the discussion did not suggest swapping wholesale to a style that suited theirs. Rather the talk was about interpersonal communication barriers leading to slow transition and non productivity. The talk emphasised these confusions needing to be clarified. A closer relationship between the student and the supervisor was seen as the pathway to such clarity. When the speaker below talked about responsibility his/her reference was to broadly developing a closer relationship with the student and concern for their ongoing welfare.

Extract 4. ...when you have started your studies after that it seems that the university has no responsibility to follow up a student whether he is doing good or not, how is his progress and whether they are facing any problem or not. So the students are not coming to the class the lecturer definitely has responsibility to see why some of his students are not coming to the class, what happened to them. I know this is not a school for children. There is a place for mature adults to study but that does not mean you can overlook your responsibility to do the betterment of the students.

Availability was another key theme. However again, the expression of this was in a deeper sense than simple etiquette. For the IP students it was related often to intrapersonal isolation, confusion and lowered productivity and lost learning.

Extract 5. I've heard bad experiences as well. Sometimes if you want to contact the lecturer and they are not available for them and they just have to e-mail or just have to leave a message and the lecturers or coordinator don't get back on time when they need information and you can't personally contact the lecturer or unit coordinator regarding the requirements and you can't discuss them [inaudible] problems and everything. So availability is one of the main complaints I've heard of. Especially like some lecturers take 2 or 3 days to reply. Students will be having a lot of confusions which one to choose.

The problem we identified in the data was that any disillusionments the IP students faced about poor interpersonal relationships with their supervisor, transferred not only to intrapersonal disaffection, but to intergroup sentiments of dissatisfaction and deprivation.

Extract 6. Very uncomfortable because of I don't know how to explain it. I explain to my husband for a year they still have some thing he doesn't understand and how I can meet the supervisor maybe once in two weeks and try to deal with, really hard. And the supervisor is not in this field. Is harder than if supervisor of PhD is in this field of study. So it happen many things so I think if they ask me that I will recommend the programme to [name of country] student - I don't think it is suited to international [name of country] student. Even learning style, everything. And they change without think and I ask oh you add another semester, don't you think about international student. How much money do they pay, they don't know.

There were indeed several instances where specific feelings of intergroup neglect was topicalised. While for many the concern was left at the interpersonal level, for others the specific site of disappointment was often related to perceptions that teachers/supervisors did not have sufficient knowledge about their (students') culture. Intrapersonal disaffection was therefore attributed in these cases to the supervisors' lack of cultural awareness (as a defence against own self as cause).

Extract 7. And now I face things it hard to do that because now I have to deal with the supervisor and the supervisor don't know about [name of country], about [name of country] culture about [name of country] learning style. And seem not to don't understand.

Often, an important way to highlight deficiencies in services is via recognising the benefits when these are well in place. In the following extracts the intrapersonal experiences of the IP students seem to bubble by contrast with intrapersonal confidence. Critically, the inter-personal relationship with supervisor was located as the catalyst to these. In Extract 6 below the energy in talking about the supervisors' availability is poignant for us in that the IP student is also very aware of the efforts required by the supervisor. This extract echoes part of our broader analysis that IP students are highly attentive to observing services not in place (as above) and (here) when they are.

Extract 8. I didn't choose my own supervisor. But I asked him, at the time I met Prof [name], because he is the head of school. I told him about my background international business but I would like to do emotional intelligence and I need perhaps a supervisor who did Master or PhD in clinical psychology so I could understand more. And also I would have another supervisor as a medical doctor. He agreed about that because when he read about my proposal he perhaps two supervisor from different background of study. Even though he head of school and really, really busy he always spend time for listening and understanding what they need. It's not easy to listen other student, especially international student who have no properly English or even write in English. But I heard from other international student he also have international student from Thailand but he really put his effort really good to understand what she is going to do in her research.

Supervisors' availability was identified as a cornerstone of good supervision. However it came with qualitative definition. This was well expressed by the student in Extract 9 who described clearly how being able to form a close interpersonal relationship buffered negative intrapersonal affects and associated barriers to learning. In Extract 10, for some even a small contribution seemed to make a world of difference.

Extract 9. ...my principle supervisor is there all the time and my other associate supervisor is there all the time. My principle supervisor is right across the door from the PG room and whenever I have any problems at all about anything I just knock at his door and say excuse me I'm in trouble here and another good thing about my supervisor its not only academic issues I talk about its social issues as well. If I just want to talk I'm able to go there and talk and they assist me and I appreciate that...very good because doing research and writing up and all that it is frustrating and if I didn't have a good relationship with my supervisor it was going to be harder but with a good relationship with my supervisors I find it easier, I mean it is a hard thing but you know it makes it easier if I am able to talk I'm able to find help if I need help and I think that helps me to ease the burden I think. I think it is for all students who are doing higher degrees.

Extract 10. ...a 5 minute discussion with a lecturer...asking how the student was getting on would be beneficial. 5 minutes would make the student feel connected and cared about. Just to spend 5 minutes with the student once a month is enough to spark the student to learn and to be part of the class.

Having the relevant expertise is accepted universally as a basis for good supervision. However for IP students expertise was often juxtaposed to intergroup and societal level exchanges. Supervisors with previous experience or at least sensitivity to the cultural factors/orientations relevant to the IP student were identified as ideal.

Extract 11. My course supervisor is very good because he's been to the regions of my country so he sort of well understands our culture and our needs. He is very competent in this area of expertise. He has the expertise that I require.

Supervisors were also seen as an essential link to the sorts of general orientations needed for good transition. Particularly, supervisors who were involved with the student needs for transition at an early point were also those that the students foresaw as having a guiding hand in transition throughout their process of IP study. Again positive intrapersonal affects (e.g., non isolation) went hand in hand with the positive interpersonal affects mediated by the supervisor. Simple actions were often implicated as the site the 'attention' that was topicalised.

Extract 12. That's another good experience. On the very first day I was assigned to my workstation, computer ready, everything ready to go. In fact, my supervisor on arrival took me around familiarisation,

all the various places. Then we sat down. Then okay this is what is happening, your topic. I think in that area I am appreciative. The reception is warm. The attention is there because I meet my supervisor weekly. We have a weekly meeting. The attention so far has been good.

Developing a Professional Community

At the intrapersonal level, the IP students we talked to also expressed quite specific professional development aspirations. Indeed these needs were often detailed as motivating their international travel. Such intrinsic motivations shaped an expressed desire for opportunities to develop networks. Many IP students were acutely aware of their need to actively take responsibility for finding such professional interrelationships. Embedded in this talk we found the students' realization of possibilities for societal level outcomes of 'international knowledge'.

Extract 13. Actually I would like to have many experience, you could say international experience. Because I lived for about 6 months in [name of country] when I was a child. I did my Master in Europe, I know about their education system. My father really like, he's a doctor, also my mum is also a doctor. But my father liked to travel a lot to attend international conference. So he has many friends from around the world. So I think it is really good to for me as I take my father as an example I need to study abroad not to study the subject but also to have many friends from around the world. So when my farther decide to open a small hospital perhaps in the future after that it will be international and also myself would like to open a kind of consultant company together with my friends. And I would like in the future perhaps in the next 10 years it will be current international, it will have international knowledge. In the beginning I have to study in many countries. Now I'm doing in Australia, so I know what Australia is there, what they believe here. My friends now study in German, so we really know about that. So when we finish our study back to [name of country] we develop a really good company.

Extract 14. One of the things I came to Australia for was the networks, developing. Get to know people, opportunities. I could have done my postgraduate study anywhere in the world but I chose Australia because I was looking to the future, get to meet people from different cultures. And that was the main objective. Unless you actually take the initiative yourself to get to know people, there are no structures in place to help this. No student associations, no active ones anyway.

Though many of the participants expressed an active intention to develop networks, these 'professional' motivations also meant an acute awareness of the sorts of facilities and opportunities that should support such networking. Again this talk evidenced mature, experienced voices cognisant of both their own professional learning needs and how these could be met and the potential for intrapersonal remoteness if not.

Extract 15. Apart from the supervisor we have some sort of morning tea where all the graduate students come together, share your experience and that kind of thing. So from that you learn a lot from other people. It is something that the [name of school] put into place. Every month we have morning tea where we discuss our ideas in a larger group. Apart from your usual contact with your supervisor. Graduate students come together to share their experience. I think that is a good thing.

Extract 16. The difference this time, PhD, you don't have lectures with others. It is not easy (making friends) unless your research somehow it has bring us together. If that facility hadn't been initiated you don't even meet. There needs to be somewhere to bring you together. The graduate level, the research students you are your own being, you talk with your supervisor, you don't have that much contact with colleague. So my experience is if an environment is created where people can meet occasionally it is good. If you are someone is social you will be isolated.

The key in most of the IP students' talk about interpersonal relationships however, was not socialising per se. Interpersonal relationships were characterised as professional 'networking' and getting 'acquainted' with or exploring new systems of thought and process. Clearly this motivation is that same one that ignites the sort of social benefits that proponents of IP education acclaim. In these extracts we can observe the sorts of supports that directly facilitate a community full of learning and social exchange.

Extract 17. ...last semester the [name of school] they have conducted many seminars. And I attended 2 or 3 seminars and it was really useful for knowing crucial information. Like I wanted to do more research on a particular topic and that seminar from ECU [name of school] they organised last November they organised a seminar on management information systems and web centre I'm not sure. So that conference provided a lot of useful information for me. It was a good way of socialising you could say.

Extract 18. Yes. I think that is okay. That is socialisation that I am talking about. If such opportunities are created you get to know many people and you never know who can be of help. In fact, the idea is not to go and enjoy such occasions, it's to do a little more knowing, networking. The most important thing is to try and get yourself acquainted.

Extract 19. There is nothing more important than networks. It's not what you know but who you know. And where do you get to meet people if not interacting at uni and sports and by interacting at work you get to know people. And who knows what opportunities may present for the future. I will go back to [name of country] there may be some opportunities for trade or business, I know nobody. I'm trying to get to know as many people as I can.

Thus in Extract 18, the speaker talks about getting 'acquainted' not simply to others— but to new systems and professional context. However, there was a qualitative difference between the presence or advertising of potential gatherings and their accessibility. Accessibility went deeper, into societal values and group based differences. The important thing to note for us was the interconnectedness of different levels of experience; each contingent on another being in place or not, or in the case of Extract 20- being not well placed. In Extract 20, intergroup 'barriers' prevented opportunities for transition and the societal outcomes of social exchange. Further, these linked to intrapersonal isolation. That is, if IP students felt uncomfortable in attending such gatherings the opportunity for social exchange through networking was lost. Concomitantly feelings of isolation were heightened. Encouraging students to attend by making meetings genuinely accessible seemed paramount.

Extract 20. I think that the uni has done a lot because this department has the sundowners. But of course I feel out of place to go to such occasion because I don't know who to talk to or what to talk about because you need to have friends to go to such occasion. Trying to get into the culture that is the most important thing. Maybe the barrier here is that because I find that Australian are very much an individualistic society and I come from an Asian background where are more like family value. When we talk about friends we feel that we care for our friends.

The ideas of 'closeness' and 'familiarity' expressed in Extract 20 were themes through much of the IP student's speech, particularly those from Asian background. Where these values were not present the idea of social exchange seemed to fail, replaced by inter group and interpersonal distance and sense of intrapersonal disaffection. Thus for many the onus was on the suggesting the design of activities that developed a cultural environment, or simply one that was approachable by the IP student.

Extract 21. From that experience, and also from my stay the activities at this moment existing is not enough, is not appropriate and is not sensitive to international students so they can be attracted to participate. They are from different countries, different culture, their universities have different

environment. Some activities it is very hard to attract the students because some may not be suitable for them. For example, the Moslem students, they do not drink so any activities full of drinking, then in future you may try to avoid those activities, you may think it is not my place to go there. So the activities also should be multicultural to show this is a multicultural institution and we respect diversity.

Extract 22. For me as a PhD student I am very lonely. Sometimes I received one e-mail asking come and have a cup of tea. So I don't know what to do there, going there and having a cup of tea. So then I thought what would attract me. So I found the attraction could be the presentation, the attraction could be the PhD students gathering. I suppose not to gather with the bachelor students because they would feel I was quite elder than them. So it should be a gathering of the similar kind of students. I never saw any activity that attracted me. I do not know any teacher, I only know my supervisor. When you have the foreign student here you need to build the environment that the foreign student feels is homey. In my school I'm sure no one knows me beside my supervisor and I know no one. So how it happened and what could be the mechanism to break that kind of gaps.

Diversity From Cultural Relevance

A large part of the talk we gathered was explicit about the needs of the course content as needing to assist the IP student. Moreover this was explicitly topicalised as a key to develop diversity outcomes through gaining (or in some cases imparting) international knowledge. Overall, IP students were highly motivated to gain knowledge that would be applicable in their home nations.

Extract 23. I think that the first expect for international student to come here is about to learn from another people, from another place and learn how the education system here because most of them are already teachers in [name of country]. We are teachers there so we learn how to teach here. Teacher behaviour here how student here or educational system here...So when we can experience here we go back to [name of country] and we can tell or teach or have an experience for our student.

In several interviews a perceived lack of international content was the expressed agent for intrapersonal angst. The claim was that their needs as an international student were not accommodated by the course.

Extract 24. Because [name of course] doesn't have much say in [name of country] at the moment I just need to get something to get it started. I have been very proactive – in ethics it is all about how you need to work in Australia and the boundaries and that and I said, especially in the ethics class, I said you need to give me something for me because I need something to help me practice properly when I go back home – for me it wasn't as big an issue because back home there isn't much for me to go on ..but it has been work for me because everything I learn I need to apply to a different context and it isn't only applying it to my placement [here] it is about applying it to a different context altogether and that's not catered for at all. This semester there probably won't be any changes to the class but they need to think about these. There is no structural adjustment to account for cultural difference.

The interconnected nature of levels of experience was prevalent here too. Any intrapersonal concern was just as easily transported to an intergroup concern. The risk within a mismatch of expectations over course content was that, for some students, a mono-cultural view within the course developed a sense of intergroup tension.

Extract 25. Because the courses are done for Australian students and not for international students and then some students for example are doing environment and they need to know a lot of Australian stuff like law and I said why don't you try and do some other units that will benefit you when you go back home, because unless you are going to work in Australia that isn't going to help you and they haven't been as

proactive in going and saying can I do something else. But at the end of the day when they get back home it is quite pointless.

Extract 26. I knew nothing I had no idea about you know cultural bias and that it is very difficult to anticipate unless you have previous study experience it is very hard for me to anticipate that I needed different you assume that whatever you learn is going to apply to everybody you just don't know.

Extract 27. ...no its not they seem to think that if they want to learn stuff relevant to their own country they should study in their own country but there are places where you just cannot do that like [name of country] because there is not university there...

Extract 28. ...exactly and on a societal level you've got people telling you that because you are in Australia you need to learn to work with Australians but what part of the Australian population does this mean?

The problem was that intergroup feelings and intrapersonal sentiments of marginalisation and exclusion were related. This was perhaps promoted by the fact the IP students we talked to had sophisticated appreciation of their own learning needs. This sharpened their expectations about the applicability of the course content.

Extract 29. Many of the students were talking about the course structure. They said the course structure is not timely, standard comparing to what you are learning. When you finish the course you have expectations I will have this kind of knowledge and that knowledge can be trusted to [inaudible] in professional life. And there is a big discrepancy in that. So the course structure, according to many students, is not timely, outdated, not realistic in terms of your professional entry and your professional life.... I know that education is a commodity these days and all the universities are trying to attract the foreign students. I don't see any problem with that policy. You need to be careful that the students are not exploited in the name of attraction. It is not a commodity like other commodities. You cannot exploit the student and take their money and don't care about their future.

For others, the lack of opportunity for diversity was raised critically as a barrier to the sharing of cultural knowledge overall and as a lost opportunity for cultural exchanges.

Extract 30. I was going on and on and I didn't shut up but these are real life issues for me and is it going to be thought that ok [name of student] has gone now but it might be relevant to other students so lets ask the questions – they [cultural issues] need to be there – other students would benefit from this [multicultural context of Australia] but even the Australian students are not catered for.

In all the data, we found perhaps the strongest sentiments expressed in the context of the course and its relevance. This is not surprising given that many of the IP students choose the path of international study often at great investment (Guilfoyle & Halse, 2004). It seemed overriding therefore that the content of course supported the expectations of the incoming IP students or that the pre arrival expectations were consistent with what could be provided.

Extract 31. I wasn't too sure because I had checked with the association of [name of course] because there are lots of [name of course] the world over. Some of them are more recognised than others, some have absolutely no value at all. I wanted to be sure that if I am studying at ECU it has to be something that has to be valuable for me because I am giving up so much.

CONCLUSIONS

Our approach found grounded definitions of learning, community and diversity in the speech of IP students. Of course we do not suggest a redefinition of these large terms per se, only we add qualification based on the everyday experiences of the students. We argue that when looking for essential sites for quality – in the IP context we need look first therefore to optimising some of the immediate conditions under which the social benefits from hosting IP students feasibly occur. Future planning therefore should prioritise developing these conditions as the primary sites for quality.

In the context of learning, IP students expressed a need for a close interpersonal relationship with their supervisor. A prototype supervisor was highlighted as attentive to the student's needs, particularly during orientation, a link to resources and being 'available', including availability for personal rapport and approachability to answer broadly framed questions, and with some exposure to the student's region or various cultural sensitivities. Some of these dimensions on the surface might seem trivial, but in the student talk they were prioritised and ran deep, often symbolic of broader caring for the IP students (see also Guilfoyle & Halse, 2004). Prilleltensky (2003) suggests good supervision maintains asymmetrical power relations in the learning context. Our data would support and indeed extend this in the IP student context. Poor supervision was the antithesis to such asymmetry— availability and approachability were deemed low. In particular a lack of consideration for the students learning style, past learning experiences, and past status, appeared damaging on many levels of experience/exchange.

Though students dedicated a lot of talk to their supervisory relationship, for many learning interactions outside of their supervisor also were critical. It was here we found an interesting qualification of the concept of 'community'. The sort of community topicalised involved development of professional networks - as one put it 'getting acquainted'. Community was not akin to the sort of rhetoric that suggests large scale integration with the local environment (though this was not excluded). Rather it meant being afforded spaces to develop professionally, in perhaps what Hanno (1999) refers to as a 'community of learning' – in the first instance.

For the IP students we talked to, 'diversity' opportunities were also located tightly within immediate learning/teaching forums and courses that reflected international content. The claim was that this allowed them to introduce their own past learning and knowledge applications as well as learn applicable systems. These IP voices echoed Bartell (2003) who argues within current global climates it is increasingly important for students to develop an "international literacy" premised on respect for difference and achieved by integration of the student's external world into the learning environment. This integration avoids privileging one group over another (Riggs, 2004) and creates the conditions for social exchange (Tierney, 1999). For us then there is an interesting inflection on diversity. Like 'community', 'diversity' can often appear as an abstract concept – with hypothetical flows of social exchange flowing through a broader community. For the student's diversity was not an abstract filtration – it was grounded, opportune within well planned course content.

We can link the data generally to a more critical approach to education such as Freire (1999) who argues educational processes that support a multicultural population require re-examining any taken-for-granted knowledge currently privileged and disseminated. Tanaka (2003) suggests that Australian universities should take the lead in promoting a plural society based on mutual respect and understanding of difference as a '*culture*' of the university. We argue developing this *culture*, fortunately, can occur via some fairly simple mechanisms – such as adapted supervision, professional interactions and course content, each developed through grounded definitions. Planning for quality IP education should not overlook these immediate and highly interactive 'everyday' teaching and leaning sites as *the* initial grounds for establishing the pluralism attached rhetorically to IP education.

Future research at the institutional level should explore these dimensions more specifically. The application of a levelled analysis we argue is useful. It helps explicate how positive or negative teaching and learning experience transfers to other levels of experience; and how such experiences can interact with social exchange. For example as shown, one lack of service can trigger intrapersonal isolations which prevent interpersonal interactions, develop intergroup tensions and prohibit societal outcomes. Or learning style barriers can also lead to negative intergroup feelings, poor interpersonal connections and intrapersonal isolation. Finally the data characterised IP students as appreciative of services being in and out of place, and to community, diversity and learning, and further highlights this population as critical for future research and planning.

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Hair, M. Edith Cowan University, Australia. Delivering Theatre Education In The Kimberley

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This paper focuses on one small indigenous theatre course run by Western Australian Academy of Performing Arts, a school of Edith Cowan University, in Broome, Western Australia. The particular focus is on the process of collaboration between the campus and the community in targeting cross-cultural issues in Performing Arts Education.

Introduction : Why do we do it?

The town of Broome, known to its Traditional Owners as Rubibi, is the largest town of the Kimberley, an extremely beautiful and diverse area in the far north west of Western Australia. Due to its isolation, the Kimberley was one of the last areas in Australia to be colonised by European settlers. Local Aboriginal people believe that this is where human beings were first created, when the spirit beings came in from the reefs and lay down on the warm sand to dry out. The official *Broome Street Guide, 2004 Edition*, on its front page, contains information from the Rubibi council of elders.

During Bugarrigarra (The Dreamtime) Aboriginal people, their land and culture were created within this area.

Major song-cycles originated here, crossing the continent. Oral history relates Dreamtime stories about before and during the dinosaur period. As a place of creation this area is sacred for the Aboriginal people.

The Rubibi council brings together the Yawuru, Djugun and Goolarabooloo people. Other groups from the Broome region include Bardi, Jawi, Nimanburu, Nyul Nyul, Jabirr Jabirr, Karajarri and Nyangumarta people.

The song-cycles are ritual sequences of poetic songs and dances which follow the Dreaming tracks of the Creation Ancestors. These tracks may traverse the country of many language groups, with the individual language groups being responsible for maintaining that part of the cycle which crosses their country. Aboriginal people believe that maintaining the song-cycles through performance of the songs and dances is integral to keeping the country and human beings alive. This sacred relationship between country, life and performance entrusts Indigenous theatre in Australia with a particular responsibility, namely to engage in the process of cultural retrieval which would allow the recovery of what Wole Soyinka (Crow & Banfield 1996:11) calls 'those elements which render a society unique in its own being, with a potential for progressive transformation'.

The free ability to maintain the song cycles and other ceremonial activities was interrupted by the arrival of pearlers and pastoralists in the second half of the nineteenth century. Both groups 'blackbirded' Aboriginal people as labour. Pastoralists fenced land and prevented access to water sources and ceremonial sites. The official *Broome Street Guide, 2004 Edition*, benignly describes this period without reference to the dire consequences for Indigenous people.

The movement of pearling into this area in the 1860's brought European, Chinese, Japanese, Malay, Philipino, and Torres Strait and Thursday Islanders. Broome was established as a pearling settlement in

the early 1880's. Today's cosmopolitan population has its origins in the pearling activities of the last century.

Local writers, musicians and playwrights however have filled in the silences with songs that celebrate the lives and loves of pearling crews rather than pearling masters and plays, like Mary Durack's *Ship of Dreams* (1968) and Jimmy Chi's *Bran Nue Dae* (1990) and *Corrugation Road* (1996), which reveal the dark underside of colonisation. While *Ship of Dreams* satirises the follies of the pearling industry, Chi's plays use music and humour to tell the indigenous side of the Kimberley story. *Bran Nue Dae* tells the story of the Stolen Generations, Aboriginal people who were 'taken away' from their families and sent to missions, to Catholic educational institutions, to jail; *Corrugation Road* represents the results of this dislocation in the form of mental illness and suicide. Using plots based on journeys, with characters who reject victimisation and return to their country and loved ones, these works reclaim the territory of the songlines. Through countering the imperialist narrative, they allow indigenous peoples to reject what Ngugi and Fanon refer to as 'colonisation of the mind'. Indigenous theatre forms a powerful tool in the 'need for subjugated peoples to recuperate their histories, traditions, narratives and discourses' (Edward Said, in Crow & Banfield 1996: 15).

Theatre historian Katharine Brisbane (Crow & Banfield, 1996:61) has said that '...the past in the present, the past bearing down upon the present, is probably the most consistent theme in contemporary Australian drama'. Maori academic Linda Tuhiwai Smith (1999: 4) explains why reclaiming the past is culturally important.

The past, our stories local and global, the present, our communities, cultures, languages and social practices – all may be spaces of marginalization, but they have also become spaces of resistance and hope.

In Australia, to work or study in the area of Indigenous Performing Arts Training is necessarily a political act. In a post-colonial nation, the embodiment of the nation's history through theatre inevitably involves examination of the acquisition of land through the oppression and genocide of the indigenous inhabitants. Far from being a negative situation, this provides a highly creative opportunity for 'the academy' to work alongside 'the Other' to deconstruct imperialist history and envision a new society. Such a creative collaboration forms the foundation of Indigenous Performing Arts Training, and to be authentic requires the need for constant surveillance to maintain cultural protocols, a two-way flow of information and resist the mere imposition of a Western educational format onto an indigenous story.

Driving into Broome from the east is an unsettling experience. Travelling through the inland or freshwater country of the Kimberley, despite the fences, the traveller is conscious of being in Aboriginal Australia, where whitefellas or Kardiyas are in the minority and the landscape is dominated by red cliffs, boab trees and low scrub. Entering Broome precinct is to suddenly encounter palm trees and white tourists in huge numbers, lured by the white beaches and artificial tropical atmosphere. Indigenous people, visibly marginalised as they sit in small groups in the park or mangroves, have little access to the exhibited wealth and prosperity, except through opening their lands and culture to the tourists.

Brief History of the Course : How do we do it?

Western Australian Academy of Performing Arts (WAAPA), a school of Edith Cowan University, has been offering Certificate 111 in Theatre (Aboriginal), a one year full-time VET course, in Broome for approximately ten years. The course was developed in response to community requests after the success of Jimmy Chi's indigenous Broome musical *Bran Nue Dae*, which toured Australia, in 1990. Theatre was suddenly seen as a viable and culturally appropriate means of employment.

The existing course was instigated by Broome TAFE; Western Australian Academy of Performing Arts (WAAPA); Broome Aboriginal Musicians Association (BAMA); and Goolarri Media Enterprises Pty Ltd, an indigenous media association. The course also runs in Perth, where it was initiated by the Black Swan Theatre Company. Thus the course was born from a collaboration between the community and the educational establishment, with the goal always being to provide industry-recognised training, and therefore employment, for indigenous people.

Originally, Kimberley College of TAFE was to be the Registered Training Provider as the manager at that time was trying to focus Broome TAFE on Aboriginal education, and saw performing arts as a training priority since there was 'a critical mass of performers'. WAAPA became the training provider due to having expertise in performing arts training, however the course maintains close relationships with all the original stakeholders, particularly the indigenous performing arts community. The complication of WAAPA being the training provider is that the decision makers are situated two thousand kilometres south of the campus and community. It would be possible to argue then that the relationship between the university in Perth and the satellite campus in Broome is an imperialist one, since it involves 'the practice, theory and attitudes of a dominating metropolitan centre ruling a distant territory'. (Edward Said, 1993) Operating in the Kimberley, our small satellite campus is indeed like a colonial outpost to the metropolis of the university in the big city 'down south', another climate and culture away. The imperialist relationship is disrupted, however, by the practice of collaboration with the distant community, since the term 'collaboration' implies that the parties involved in the collaboration are operating from a position of equity.

Political and economic equality not being current reality, equity in this instance must be characterised by a respectful relationship, or what Hegel (in Crow & Banfield, 1996 :3) called 'reciprocal recognitions', a condition basic to self-consciousness and human relationship. 'Reciprocal recognition' must include truthful acknowledgement of our shared history of invasion and colonisation. Invasion and colonization manifest in the present as the reality of our students' lives. As Linda Tuhiwai Smith (1999:4) points out '...many indigenous communities continue to live within political and social conditions that perpetuate extreme levels of poverty, chronic ill-health and poor educational opportunities. ...The problem is that constant efforts by governments, states, societies and institutions to deny the historical formations of such conditions have simultaneously denied our claims to humanity, to having a history and to all sense of hope'.

Under a John Howard Coalition government this denial continues through increased funding for already wealthy educational institutions and decreased funding for public education, attended by the working classes, including indigenous people. The Coalition's education policy has been examined and criticised by the National Indigenous Postgraduate Association (NIPAAAC).

The Coalition.....have increased HECS, introduced up-front fees, abolished an Indigenous-only undergraduate scholarship scheme and made a mess of ABSTUDY. (Speechley-Golden, 2004)

John Howard's refusal to say sorry to Indigenous Australians for the atrocities of the past reflects his refusal to acknowledge the reality of our nation's history and reinforces the secrecy which has surrounded events like massacres, keeping Indigenous people disenfranchised. Carol Martin, indigenous Labor MP and member for the Kimberley, has said that 'uncovering the truth about poverty in the region was a societal concern largely overlooked and was not well-documented. Something like 45% of people are

unemployed, not accounting for those eligible for work-for-the-dole schemes' (*Broome Advertiser*, 4/03004).

The majority of our students, who most commonly have their roots in small Aboriginal communities outside Broome, are economically reliant on social welfare payments. Our students also experience different social pressures to mainstream students 'down south', including responsibility to family and responsibility to culture. Constant difficulties with Centrelink, the social welfare provider, particularly since the closest ABSTUDY officer is in Darwin, have caused most students to miss class time. Financial problems form the most common reason for students to leave the course. Attendance, and therefore academic success, has a strong relationship to stable financial support for students. Unfortunately for potential future students, attendance and academic success also have a strong relationship to the University's justification for continuance of the course.

In Australia, to work in the area of Indigenous performing arts training is to work in a climate of constant uncertainty. Because our student numbers are small we operate under the perennial threat of our courses 'being closed down'. For example, since writing the abstract for this paper, the Broome indigenous theatre course has been temporarily closed due to lack of a suitable venue. It is possible that the course will never re-open due to the University's policy of concentrating resources on its three main campuses in the south of the state, 2250 kilometres from Broome, and eliminating any satellite campuses. In a state the size of Western Australia, where 64% of Indigenous people live outside the city (Australian Bureau of Statistics : 2001 Census), this creates serious issues for indigenous education.

Place and Displacement (again).

Physical location of the course is another site for the active practice of 'reciprocal recognition', in the form of sensitivity to Indigenous people's experience of colonialism. Over the past ten years the course has been housed at various venues, including hot tin sheds at Goolarri Media Enterprises Pty Ltd, St Mary's Catholic High School, Notre Dame Catholic University and Broome Civic Centre. The University does not have the funds to pay high commercial rental rates. Lack of a secure venue has been an issue since the inception of the course and continues to be the most pressing argument, in the university's eyes, for closure of the course. Currently WAAPA @ ECU is continuing to negotiate for a permanent base, which would allow us to offer quality performing arts training effectively, and continue to contribute to the cultural life of Broome.

The previous location of the course in Catholic institutions, like St Mary's High School or Notre Dame University, would seem to demonstrate collaboration and partnership between universities, however such location raises several problems in relation to equity. Many Aboriginal people have disturbing memories of the Mission days, when Indigenous peoples were forced off their lands and into either missions or government reserves. Here they were prevented from practising their culture or speaking their traditional languages. The Missions were actively involved in receiving and 'educating' the Stolen Generations, children who were forcibly removed from their parents and raised in government or Church institutions. For this reason, many Aboriginal people would prefer to study in non-denominational public schools and universities. Closing ECU's 'satellite' campuses in Broome, WAAPA and Kurongkurl Katitjin, the School of Indigenous Studies, would allow the Catholic institutions to entrench their monopoly on Higher Education in Broome and decrease choices for indigenous students. A further complication stems from the amount of land the Church managed to accumulate in Broome during the Mission days, so that many of the sites deemed 'Educational Precinct' by Broome Shire are now in fact Catholic owned land.

The metropolis / outpost model metaphorically reflects the contradictions and possibilities inherent in the relationship between the university and its distant client community in the Kimberley. The metropolis

stands to be considerably enriched by embracing the unique social elements made available to it by its relationship with the outpost. If the role of Higher Education is to truly bring about a transformation and enrichment of social consciousness, then factors other than economic ones need to be considered and constantly evaluated.

But who are the collaborators? In this case, 'the University' is represented by the Course Co-ordinator. Over the past ten years the course has had several Co-ordinators, only one of whom was indigenous and local to Broome. In other words, most co-ordinators have operated from the Theoretical position of Outsider. This means always starting again from the beginning, never having Insider knowledge as to the best community people to go to for information. This is where collaborating with local cultural organisations, which have expertise in mediation, representation and negotiation, becomes imperative.

Luckily, being situated in an artistic community where Indigenous people still practise their law, language and culture provides us with a diverse pool of tutors and thereby the opportunity to both ground the course in traditional culture and to produce innovative contemporary theatre. This potential is being developed through a number of collaborative initiatives:

- Establishing an Advisory Board comprised of Indigenous arts practitioners, who can advise on curricula, support the Course Co-ordinator and advocate on behalf of the students and the community.
- Tendering of the subject 'Community and Cultural Skills' to *Rubibi*, the association of the traditional custodians of law, culture and land in Broome. The subject is now conducted off-campus at Minyirr Park, an area of cultural significance where three major song cycles connect.
- Collaborating with *Yawuru Traditional Dancers* and *Wogadagum Cultural Association* to teach traditional Indigenous dance and Torres Strait Island dance respectively.
- Increasing the number of Indigenous tutors on the course, with the aim of having tutors who are successful in their fields as positive role models for the students. The course provides critical employment for local artists and musicians as tutors, and also employs traditional elders as tutors in culture and language.
- Developing links and partnerships with professional and community Indigenous organisations such as Goolarri Media Enterprise Pty Ltd and Bugarrigarra Nyurdany Aboriginal Art and Culture Centre. The Art and Culture Centre assists the University in following correct protocol in contacting and employing traditional owners as language teachers, cultural advisors and teachers of traditional dance.

These partnerships should both provide the course with cultural authenticity and locate ownership of the curriculum jointly with the university and the community. Problems in the curriculum will be addressed when the course is re-accredited next year, in collaboration with Charles Darwin University, Northern Territory.

The Curriculum : Collaboration for Authenticity

The curriculum for Certificate 111 in Theatre (Aboriginal) contains some excellent subjects, which should theoretically lead to students being deeply grounded in traditional culture before moving into studying and creating contemporary performance works. There are also subjects which raise serious concerns and expose some of the dangers inherent in cross-cultural education.

Problematically, this curriculum was written, then re-formatted into competency-based modules, by two non-indigenous men. One subject, *Community and Cultural Skills*, boasts the Unit description :

This unit provides a multi-disciplinary overview of Aboriginal life experiences and local indigenous culture which will include places of cultural significance as well as cultural skills such as making spears and boomerangs, basket weaving and language. (Course Accreditation Document, 2001)

All this in 65 hours! Obviously it would not be possible for the University to deliver such a subject without the collaboration and co-operation of Traditional Elders. But what if the elders regard information on places of cultural significance as secret, as opposed to public, knowledge? What if the processes of colonisation have removed people's ability to carry out their traditional occupations or speak their languages? What if the elders do not speak English, and therefore cannot transmit the information? What if the elders are in court, working on Native Title Claims, as happened this year, at the time the University has timetabled the subject? What if the elders are out on their country practising law at the time the University has timetabled the subject? Or someone dies, and people have to attend to sorry business? The process of collaboration, therefore, in cross-cultural education is a process of constant negotiation, of strict adherence to protocol, and the utmost flexibility.

Linda Tuhiwai Smith points out that consultation with elders involves a dynamic reciprocal relationship, with an expectation of 'reporting back' to the community, and 'sharing knowledge' (1999:15). As part of 'reporting back' to the community, last year's students performed their show *Dreaming Stories* for elders living at the old people's home. The elderly audience freely responded and commented on the performances, even while students were still on stage. Sometimes audience comments reveal conflicts between meeting the requirements of the curriculum and cultural protocol. For instance, the subject *History of Indigenous Writing and Performance 2* focuses on the work of the late playwright Jack Davis, a Nyoongah man from the south west. The students' end of year performance, *Shake a Spear*, included scenes from one of Davis' plays, *No Sugar*. Feedback from the community indicated that it wasn't culturally correct to perform Nyoongah work 'out of country', although it was allowable since it was a Nyoongah student performing the scenes. This subject will need to be considerably redeveloped, with community consultation, when the course is re-accredited next year.

Copyright of intellectual and cultural property rights is another issue for authenticity in cross-cultural education. The teaching of Traditional Dance is one example. Last year's students refused to perform particular dance steps without being assured by their teacher that Traditional Owners of each dance had given permission for the dance steps to be taught and publicly performed. The students insisted that this permission be printed in the performance program.

The notion of authenticity is itself problematic, particularly in a multiracial community, where people have often been removed from their country and brought up in missions or on reserves. Under colonialism, the notion of authenticity has been used to prevent Indigenous peoples from claiming Native Title rights. However Indigenous peoples themselves have claimed and politicized the concept of authenticity, both to articulate 'what it meant to be dehumanized by colonization' and to reorganize 'national consciousness' in the struggles for decolonization' (Tuhiwai Smith, 1999:73). The notion of authenticity can powerfully evoke a time when there was no colonizer.

Surveillance of the curriculum for imperialist practices reveals both potentials and pitfalls. For example, the unwieldy name of the course, Certificate 111 in Theatre – bracket Aboriginal – close brackets, exemplifies its peripheral place in the academy. A comparison between the bracketed naming and the closest alternative, Certificate 111 in Aboriginal Theatre, demonstrates how the brackets immediately relegate Aboriginal theatre, and implicitly Aboriginal theatre students, to a lesser status than mainstream theatre courses. Removal of the brackets re-empowers the study of Aboriginal theatre to its rightful place as a recognized tradition in contemporary Australian theatre, with roots extending beyond invasion and colonization, however still implicitly excludes Torres Strait performance traditions. A more acceptable alternative might be Certificate 111 in Indigenous Australian Theatre. Renaming the course Certificate 111 in Black Australian Theatre would further politicize the naming to an examination of theatre which actively resisted imperialist discourse. Such a renaming would firmly align the university alongside the community in the goal of achieving decolonization and self-determination for Indigenous peoples.

Outcomes : who do we do it for?

Of the three categories of Theatre Studies courses, namely the Generalist Study of Theatre, Theatre in Education and Vocational/Professional Training (Kiernander, A. 1997:5), Certificate 111 in Theatre (Aboriginal) falls into the third category, since a stated goal of the course is to prepare Aboriginal and Torres Strait Islander students for either employment or further training in the entertainment industry. Graduates have most recently been seen in Barking Gecko Theatre Company's production *Crabbing at High Tide* and Yirra Yarkin Theatre Company's *Muttacar Sorry Business*, and as trainees in Marrageku Company's forthcoming production based on Yawuru Aboriginal Dreaming stories. Although these companies are based in Perth and Sydney respectively, these productions were all developed in Broome or the Kimberley. One graduate, now dance tutor, has formed his own dance company for which he has just choreographed and premiered a series of dances, *The Six Seasons*, at Sun Pictures, Broome, before going on tour. Providing the details of these performances and companies may seem unnecessary or irrelevant, however what this information translates to is that the majority of graduates do not tend to move to the city to further their training or career, although some do, but prefer to remain on their country, working however tenuously in community theatre.

Idealistically, it would be hoped that these graduates chose to work in poorly-paid indigenous community theatre, just as Ngugi wa Thiongo chose to write in Gikuyu rather than English, due to their commitment to offering their families and communities the 'experience of self-recognition'. (Crow & Banfield, 1996:61) Realistically, their decision may reflect their actual lack of choice. Aboriginal actors are still predominantly employed to portray Aboriginal characters. 'Colour-blind casting' remains an idealistic concept, not practiced by the mainstream entertainment industry. The lack of Aboriginal characters and actors on our film and television screens excludes indigenous people from representation in popular culture, limits employment opportunities for Aboriginal actors and answers Bobbi Sykes rhetorical comment on the term post-colonialism - 'What? Post-colonialism? Have they left?' (Tuhiwai Smith, 1999:24). As Ngugi wa Thiongo (Crow & Banfield, 1996:16) points out, cultural imperialism is 'the major agency of control during neo-colonialism'.

Consequently, for the University to achieve its goal of educating Indigenous students to work in the entertainment industry, it would also need to actively advocate on behalf of those students by educating the mainstream industry to employ Indigenous graduates. Another possible, but more expensive, option would be to collaborate with Goolarri Media in Broome in developing locally produced dramas.

Cultural imperialism can be sneaky and insidious. For example, one of the key cultural events on the Broome calendar is the annual Shinju Matsuri Festival. This festival is traditionally held each year at the time of the full moon in August, and is a combination of the Japanese O-Bon-Matsuri (Feast of Lanterns) and the Chinese Hang Seng (Feast of the Dead). The festival was formerly a celebration of the diverse cultures in Broome, with many free performances and community events. Now, with a business focused non-indigenous committee, the festival is dominated by expensive 'high culture' events such as the Shinju Ball, art openings, operatic performances etc, where shows are 'bought in' from the metropolis instead of developed locally, and are targeted at the tourist dollar. The local community are economically excluded from attending what was once their own festival.

Local situations like this one raise questions about the University's breadth of responsibility in and to the community. In order to gain credibility in the community as an advocate of Indigenous performing arts, and to truly demonstrate partnership and collaboration in the struggle for cultural recognition, the University needs to be seen to be pro-actively penetrating local committees to ensure our students have performance opportunities in their own community. Tuhiwai Smith (1999 : 15) describes the Maori expression '*Kanohi Kitea* or the 'seen face', which conveys the sense that being seen by the people – showing your face, turning up at important cultural events - cements your membership within a community in an ongoing way and is part of how one's credibility is continually developed and maintained'.

One activity of Indigenous performing arts training then is to support Indigenous peoples in their celebration of survival by facilitating the visibility of Indigenous artists in the wider community. Last year's Certificate 111 students performed their original Black Cockatoo dance at annual Broome show *Worn Art* and West Kimberley Festival of Performing Arts, *Dreamtime Stories* at local schools and their end of year performance, *Shake a Spear*, at Broome Civic Centre. As a result of the high standard of these performances they received many requests to perform at local schools and community events, and were offered a regular contract at a waterside Broome hotel.

Again, idealistically, this would seem an excellent outcome for the course : all the students, and their dance tutors, in paid employment for a year. Realistically, the situation is more complex. The students were unable to take up the contract for various reasons – lack of transport, lack of childcare, lack of confidence in dealing with the employer. On another level, this job could have led them to participate in their own colonization, in the form of stereotyping. What the tourism industry requires is entertainment for their patrons, something 'to keep them there drinking', in this case traditional dance and music. In countless hotels all over the world Indigenous people are engaged in parodies of their own cultures for the benefit of tourists and going home to the reality of their own poverty.

Conclusion : where to next?

Certificate 111 in Theatre (Aboriginal) is strongly owned by the Broome community. The course is seen as an avenue to further education and training as well as employment. Performances are always well attended. The presence of WAAPA @ ECU in Broome increases educational choices for indigenous people. WAAPA @ ECU is committed to providing leadership in culturally appropriate and industry effective performing arts education in the Kimberley, WA, and achieves this goal through a variety of collaborative allegiances. Performing arts training supports the Indigenous agenda for survival, recovery, development and self-determination in many ways. Performing arts can be a tool for remembering,

sharing, storytelling, creating, giving testimonies, representing and above all envisioning new ways of being (Linda Tuhiwai Smith, 1999: 142:161). Performing arts provides a direct link to the sacred purpose of the songlines. Indigenous theatre can be interpreted as presenting community rituals of healing and well-being' (Mudrooroo,1997 :162). This healing extends to both human beings and country.

It is not simply about giving an oral account or a genealogical naming of the land and the events which raged over it, but a very powerful need to give testimony to and restore a spirit, to bring back into existence a world fragmented and dying. (Linda Tuhiwai Smith, 1999:28)

Broome elder Micklo Corpus (*Broome Advertiser*, 21/10/04) puts it simply: The Song Cycle provides life for indigenous people.

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Haines T, Audy J. & K. and Killen P. Edith Cowan University, Australia. Incorporation Of Novel Ideas Into ‘Surf Equipment, Design, Materials And Construction’ Course

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Abstract: Surfboards are symmetric, relatively flat devices used for riding doubly curved water surfaces at an asymmetric attitude by physically fit individuals involved in surfing activities. Thus, surfing can be considered to be a complicated task. Consequently, surfboard performance and durability depend on design features and materials. The first part of this paper looks at an evolution in surfboard production. It is then followed by ‘as reported’ effects of different materials and design features on surfboard performance measures. A further section highlights novel ideas, and new approaches for open learning, that were incorporated into a course “Surf Equipment, Design, Materials and Construction”. During this course students are encouraged to design, shape, manufacture, and test their own surfboard(s). This approach produces numerous different results and useful ideas in terms of new opportunities for industrial collaboration as shown in the main section of this paper.

Keywords: Surf-Craft Evolution, Composite Materials, Light-Weight Structures, Fins, Surfboards

1. EVOLUTIONS IN DESIGN, MATERIALS AND PERFORMANCE OF SURFBOARDS: AN INTRODUCTION

References [1 to 3] suggest that it was the Polynesians who invented and used simple wave riding devices – surfboards. These surfboards were crafted from wood. A type and the length of board were important criteria in indicating the importance of its owner [2]. The trend was that the huge boards were made for noble persons, while commoners had to be satisfied with smaller ones. According to source [3] some early Hawaiian long-boards produced around 1830’s were around 4.5m long and about 0.5m wide and weighed approximately 50kg. Consequently, their buoyancy was good, but manoeuvrability was very low. By the 1920’s, Duke Kahanamoku had introduced long-board surfing to Australia and California [2, 4]. It should be noted that Kahanamoku rode a redwood *alaia* board in Australia in 1915. These boards were much shorter, around 3 metres long, and were shaped from a light balsa wood which reduced significantly the weight and as such improved the manoeuvrability. However, balsa wood is a soft material, thus those surfboards suffered impact damage and became waterlogged. In order to improve their strength, the balsa was stiffened with redwood stringers. Around World War 2, chemists were looking for waterproof materials and invented fibreglass resin and styrofoam [3]. The idea was quickly adopted by surfers. In June 1946, Peterson built the first fibreglass surfboard using plastic materials from a company owned by Goldsworthy in Los Angeles [3]. The WW2 era also saw a single deep fin added to the tail of surfboards [1]. This innovation improved stability. In 1960’s the West Coast Aircraft Industry developed new materials based on polyurethane foam covered in a thin, water-resistant coat made from a mixture of fibre-glass and resin [1, 4]. The application of new ‘composite’ materials to the surf industry was evidently successful and the surfboards became stronger, lighter and more buoyant [5 and 6]. Lightweight composites offered an attractive combination of weight-cost savings and improvements in performance [7]. Surfboards shrank in size and weight and surfers began using the wave’s energy more efficiently by riding up as well as down the water surface rather than just following the flow [8]. The 1980’s saw further reductions in the surfboards’ length, thickness and width. Surfboards became narrower and shorter, their planshape more curved, and importance was placed on the number of fins and fin design

features in order to get sufficient grip in the water and manoeuvrability. Generally, fins provide lateral stability (grip). The upward lift is from the planing hull, or the wetted portion of the board, and as for manoeuvrability....well, this is a real can of worms. In a single fin board, manoeuvrability increased by any of the following: moving the fin forward, reducing its rake, (these both move the centre of pressure of the fin forward, thereby reducing the distance between the centre of pressure of the fin and that of the hull.), reducing the chord length and or area of the fin (makes the fin easier to turn, reducing the rake also makes the fin easier to turn). In a multi-fin board, the above applies, in addition, manoeuvrability is increased by any of the following: decreasing the separation of the fins, increasing the toe-in and/or camber of the fins near the rails (increased toe-in also results in increased drag).

It is evident that surfboards became complex devices in which the slightest changes of one feature affect both technological and economical performance measures [1 to 8]. Thus, in the following sections particular attention will be given to the geometry of commercial surfboards and the associated surfing actions. Moreover, consideration will also be given to some reported modifications to surfboard design in the search for improved performance.

2. REPORTED DIFFERENCES IN DESIGN FEATURES OF SURFBOARDS AND THEIR POSSIBLE EFFECTS ON PERFORMANCE MEASURES

Figure 1 shows the general geometry of a commercially made surfboard. The top and bottom parts of the surfboard are depicted in pictures left and right, respectively. From Figure 1 it can be seen that the surfboard consists of four elements, namely, the nose, the body, the tail and the fin(s).

The nose is the pointed part at the front of the surfboard. It controls water flow around the surfboard sides (rails), and as such affects both speed and drag force. The body of the surfboard joins the nose at one end and the tail at the other end.

The body serves a number of functions. It provides 'support' for a surfer. When paddling it acts as a displacement hull [1] displacing water to keep the surfer afloat, and a planing hull [1] once the surfer catches a wave. The body should be strong to support the weight of a surfer and rigid enough to sustain bending forces without excessive deflection.

The tail helps to control the surfboard's manoeuvrability. It represents the area where the surfer stands and manoeuvres. The surfboard depicted in Figure 1 has a rounded square tail, which was reported to be the most popular design for 'smooth' performance of short boards [9].

Fins are used to provide lateral stability to surfboards. The forces on fin(s) submerged in water helps to control the sideways motions of the tail of the surfboard.

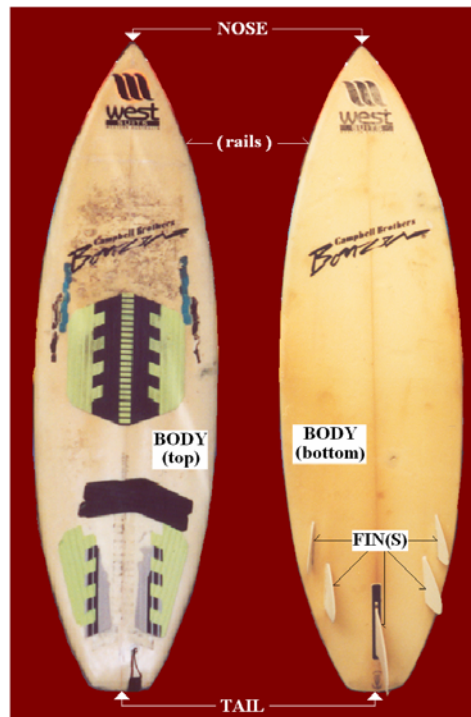


Figure 1 General geometry of a surfboard

Figure 2 is a sketch showing the salient design features of surfboard(s). This sketch was compiled from various design hybrids adopted from sources [1, 4, 7, 9 and 10]. From Figure 2 it is evident that

surfboards are quite complex devices consisting of many design elements. Traditionally, these design elements are manually shaped which makes each hand-built surfboard unique. The shaping process is time consuming and laborious. Production of 'ancient' wooden surfboards with stone tools [2] might have taken weeks and/or months while modern surfboards can be made within days. According to the source [1], 99 percent of commercial surfboards are shaped from moulded blanks that weigh as little as 3kg. The polyurethane blanks are cut longitudinally and then glued together on a wooden stringer running through the full length in the middle section of the 'future' surfboard.

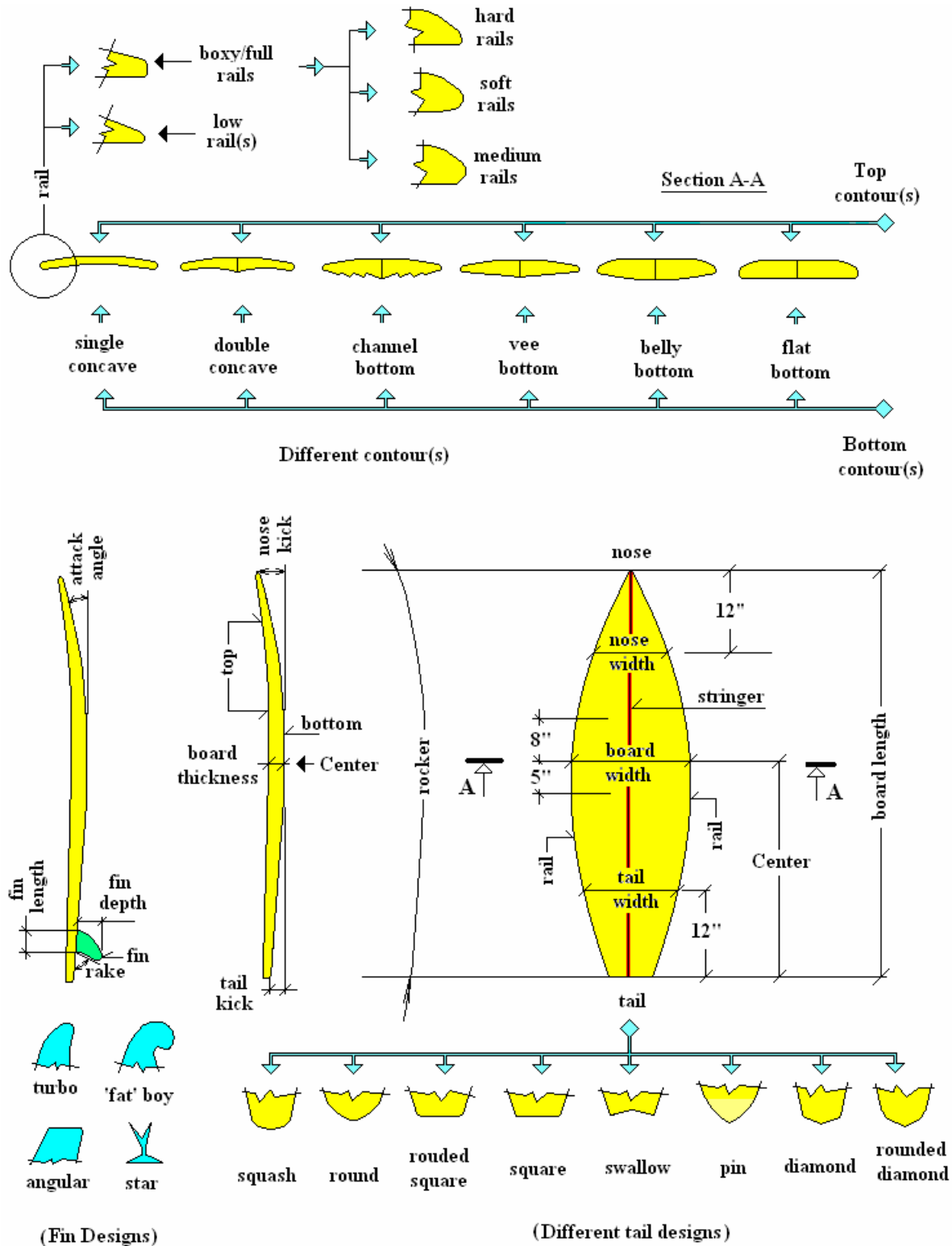


Figure 2 Salient design features of surfboard(s), after [1, 4, 7, 9 and 10]

Polyurethane is a low density ($\sim 40\text{kg/m}^3$) –very light [6]- material and the wooden stringer provides the

required strength and rigidity [1, 6]. The important blank design features are the length, width, thickness and rocker. The length, width and thickness represent the volume of the board and its buoyancy. The last design feature is the rocker. It is the curve of the board from the nose to the tail. The rocker curve is important for several reasons. In short: At the nose it provides what boat designers would call “sea-keeping” ability – preventing the board ploughing into small disturbances on the wave (this is also influenced by the overall rocker distribution). In the mid- and tail-sections rocker primarily affects speed and manoeuvrability with the usual trade-off; increased curvature enhances manoeuvrability but decreases speed.

The moulded blanks are made for variety of designs into tolerances resembling those of the surfboard shape to be made [1]. This helps to reduce labour associated with foam shaping. Shaping creates a number of salient design features that control the surfboard performance, see Figure 2. The production details and the effects of design features on surfboard performance are described as follows:

Forward from the central region of the surfboard, two surfaces of the outer edges (rails) intersect to form the nose. In the opposite direction they form the tail.

According to source [9] there are two types of rails, namely low rails and boxy full rails. One would differentiate between “boxy or full” rails and “narrow or thin” rails. Whether a rail is low, medium or high or somewhere in-between (*e.g.* 60/40) is a separate issue. Different source [10] suggests that boxy full rails differ in design and can be hard and / or soft. “Hard” or “soft” refers to the curvature of the bottom edge of the rail.

“Soft” (rounded) rails are used on boards designed for larger waves, because the flow wraps around them, creating a low-pressure region on the rail, which aids in lateral stability [11]. It also creates drag, since the flow has both transverse (lateral) and longitudinal components. However, in big waves the benefits of increased stability are much more important. Soft rails are also used in the mid and nose sections of most boards. Here they provide both lateral stability, on the inside rail, and safety, on the outside rail, as they are less likely to “catch”.

Low rails are inherently faster than medium or high rails, since the radius of curvature on the bottom edge is necessarily less and the flow will not wrap as much as it would around a lesser-curved surface.

Since the flow does not wrap around a hard rail (unless the transverse component of the flow is very small – as in the case of manoeuvres described as “rail turns”, where much of the rail is buried in the wave) this type has the lowest drag of all. However, this can be at the expense of lateral control – in which case the surfer relies on the fin(s) or, in the case of hard rails in forward sections, there is a decrease in “sea-keeping” ability – in particular, the outer rail (on the downward side of the wave) is likely to “catch”, since the sharp rail edge acts in a manner similar to a chisel. Hard rails are most common in the tail section of boards made for small to medium size waves.

Rail thickness also affects the extent to which a rail may be “buried” in the wave face during manoeuvres. Because they contribute more to the displacement of water during turns, “boxy” or “full” rails are inherently more difficult to “bury” and so the surfboard tends to ride higher (and faster) on the water – this can be an advantage when small waves and/or “fuller” waves are being ridden.

A rounded square tail was reported to be a ‘universal’ design for short boards and all surfing conditions [9]. Square tail, considered to be uncommon was reported [9] for surfboards riding small waves. Literature source [10] suggests that the rounded square tail is less responsive than the square tail and cannot make very sharp turns because of rounded edges. Swallow tail [9] is depicted by two pin tails side by side design [10] and was reported [9] to give a good “drive”. The two literature sources [9 and 10] agreed that the round tail is good for smoother turns, and surfers who are front-footed [9]. Pin tail was reported [9 and 10] to be a bigger wave tail which rides smoothly. Literature source [10] suggested that there are no significant differences in turning performance characteristics by type(s) diamond and rounded diamond tails and type(s) rounded pin and round tails. Thus, it appears that the choice is up to a shaper. One may suspect that most of the so-called properties of the tails are highly dependent on the bottom cross-section and the rocker. There are, of course, obvious differences associated with the area distribution – for example, the differences between a pintail and other, wider tails.

The next design feature is the surfboard bottom cross-section. Bottom sections are the curves from rail to rail and can geometrically be described by various shapes, namely single concave, double concave, channel bottom, ‘V’ bottom, belly bottom and flat bottom. These six shapes are shown in Figure 2, top, and were adopted from sources [9 and 10]. It should be noted that source [9] did not show belly and flat bottom shapes. A co-author of this paper, Peter Killen, prefers concaves in his shorter boards because they have higher lift/drag ratios than other sections, and supports the idea that the flat bottom is an excellent section for general use. It does not “track” like other sections such as vees or concaves, and therefore is able to be ridden and controlled (given appropriate fin and rail design) at higher yaw angles (greater cross-flow).

Generally, surfboard bottom shapes are a combination of various sections consisting of different concave and convex designs that help to control water flow and pressure. According to source [9] both single and double concave designs support speed and acceleration; channel contours are good for clean surfing and have a tendency to ‘track’ on the wave face if too deep. The “Vee” design increases manoeuvrability but lacks speed.

The attributes of the bottom sections are best understood by considering the combined effects of the transverse and longitudinal flows. Any section (other than flat) will reduce the yaw angle of the surfboard, by directing flow under the hull in the longitudinal direction. Convex sections force the flow to diverge whereas concave sections confine longitudinal flow and reduce divergence. The result is decreased pressure under the tail of a convex hull and an increase under a concave hull. This causes an increase in the angle of attack (pitch angle) and wetted area of convex hulls (for the same lift), and consequently, increased induced drag. The opposite is true for concave hulls [11 and 12]. The transverse effects may be related to manoeuvrability. For given lift and speed, and considering only **transverse** components of the flow under the board: The transverse projection of the angle of attack will be governed by the bottom cross-section. For example, the curvature of a concave acts to increase pressure towards the trailing edge, causing the section to assume a lower angle of attack for the same lift, whereas a convex section produces the opposite effect. The resulting pressure distribution under a concave hull is more uniform than under a convex section, where the distribution is characterised by a sharp peak near the leading edge of the wetted area followed by a sudden decrease. The combination of low angle of attack and more uniform pressure distribution makes a concave section less manoeuvrable, but faster. Typically, a surfboard hull is made of a combination of different cross-sections. For example, flat under the nose (better sea-keeping, no influence on direction), concave through the mid-rear area (for speed) and a vee at the tail for enhanced manoeuvrability.

It can be discerned from Figure 2 that the fully shaped surfboard can be specified by the following design features: board length, board thickness, board width, nose width, tail width, rocker, rail shape, bottom

cross-sections, and tail shape. It is assumed that the board width is the maximum width on the board and associates fairly closely with the maximum board thickness. Literature source [10] suggests that for the most surfboards the width is within the range from 18.5'' (~470mm) to 22'' (~560mm), and may be found anywhere from 8'' (~200mm) ahead to 5'' (130mm) behind centre.

Moreover, only this literature source [10] alone indicated the value for both the nose width and tail width to be 12''. The lack of quantitative information and this type of knowledge have been considered unbeneficial to either surfboard manufacturers or users. Many manufacturers are using shaping machines to do most of the shaping. They have large databases of rocker curves and thickness distributions. Rails are, of course, still largely in the hands of the humans although many shapers have a collection of their favourite rail templates!

However, the foam shaping will still need the experienced and hands-on skilled shaper to convert design ideas into reality. When the shaping process is finished, the blank is laminated usually with type E-fibreglass cloth soaked with polyester resin. Laminating improves the strength of the surfboard(s) and protects the core against contact with water [5, 6 and 10].

The final features of surfboards are fins. Fins are connected to the bottom part of the tail. Greater base length makes better connection of the fin to the surfboard and vice versa. Source [9] suggests that the greater the base length the greater the drive. Fin depths affect the control of the board *ie* the greater the depth the better the control. Fin rake influences turns *ie* greater fin rakes allow bigger (longer) turns, while lower rakes allow tighter turning arcs [9]. The surface area of the fin affects the flow pattern of water around the fin surface [10] and dictates if the boundary layer flow is laminar, or turbulent [13]. The source [14] provides equations needed for designing various wing sections that are applicable for designing the crucial fin dimensional features. The exercise is too complex to be explained in this paper, however, it should be mentioned that our students are taught and encouraged to use this approach for designing their surfboards and fins.

The above literature survey indicated that different types of waves and style(s) of wave riding would require different types of surfboards. Also the weight, height, and personal skills of a surfer will play a major role in designing or buying the surfboard(s). For example, a small and light surfer would have difficulty in manoeuvring a thick board which in other hands would be easy to paddle because of its high level of buoyancy. From the above survey, however, it is not evident how the design features change with the surfboard length. This information was sought from analysis of design features of commercial surfboards available on open market, students' work, and a survey conducted between university students involved in Surf Science and Technology Programme. The most important findings are summarised in the following Sections 2 and 3.

3. STUDY OF DESIGN FEATURES OF COMMERCIAL SURFBOARDS

A number of prominent shops dealing with surfboards around Victoria, Queensland, Western Australia, and South Australia were visited with an aim to determine the type(s) and design(s) of commercial surfboards. It was found that there were five most common surfboard designs offered for sale, namely, Fish, Short-board, Mini-mal or Fun-board, Mal or Long-board (MALIBU) and GUN-board. The main differences observed between these four type surfboards were in the board length, number of fins, nose shape and tail shape as depicted in Figure 3 (a to e).

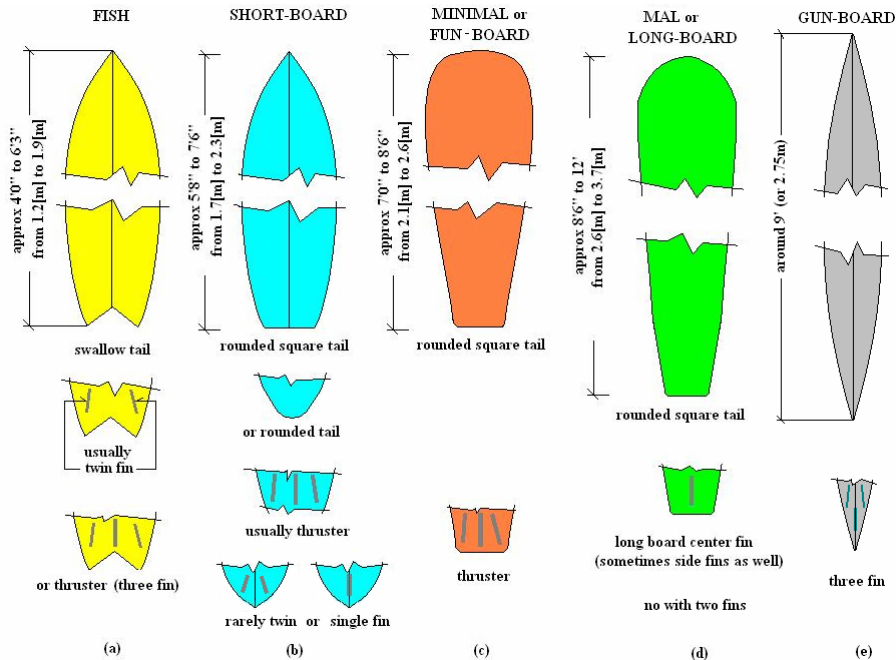


Figure 3 A sketch showing design features of five most common commercial surfboards

Type “Fish” surfboards were short in lengths, ranging from about 4’00” (1.2m) to about 6’3” (1.9m), had a pointed nose, and swallow-tail equipped with twin fins or sometimes three fins, see Figure 3(a). According to the source [2] the three-fin design (known as ‘thruster’) was invented by Simon Anderson – Sydney shaper, and presented successfully in “Bells Beach” in 1981. The type ‘fish’ surfboards featured the medium concaves reported to be good for surfing in small waves [10].

Type “Short” surfboards were slightly longer, from 5’8” (1.7m) to 7’6” (2.3m), had a pointed nose, and rounded square tail and/or rounded tail designed like thruster, see Figure 3(b). Occasionally they were made as twin fin and/or single fin surfboards. All the type ‘short’ surfboards featured medium to deep concaves reported to be good for high performance surfing [10].

Type “Mini-mal or Fun” surfboards had the length ranging from 7’0” (2.1m) to 8’6” (2.6m), a rounded nose, and a rounded square tail designed like thruster, see Figure 3(c).

Type “Mal or Long” (MALIBU) surfboards were the longest boards offered for sale. Their lengths ranged from 8’6” (2.6m) to 12’ (3.7m), and they had a rounded nose, and rounded square tail equipped with a single long-board centre fin. This fin was sometimes accompanied by side fins as well. Interestingly, no shop provided a Malibu surfboard equipped with two fins.

Type “Gun” surfboards had their lengths around 9’ (2.75m), and had a pointed nose and a pointed tail. They were offered for sale in single and/or three fin configurations. They had soft rails and a ‘V’ bottom shape.

According to various shop managers, Type “Fish” surfboards were designed for general purposes and small waves; Type “Short” –high performance- surfboards for bigger waves; Type “Mini-mal or Fun” surfboards for beginners; Type “Mal or Long” (Malibu) surf boards for small waves and easily paddling, and finally Type “Gun” for big wave riding.

From the above survey it is evident that there is continuous search for ‘perfect’ surfboard design. The creativity is without limit, it is in the mind and hands of designers and shapers. They consider the weight and height of a surfer, his/her surfing style and preferences for a certain type of waves. The process begins with the selection of moulded blanks with its design features similar to that of the final surfboard. The length, width and thickness of the moulded blank are chosen according to the height and weight of the surfer. Further design features, namely, the rocker, rails, bottom contours, nose shape, tails, and fins are chosen according to riding style and wave preferences of the surfer. It should be noted that commercially made surfboards may not satisfy all requirements of a user and a professional surfer. Surfboards designed and made to order are costly, while personally designed, shaped, painted, glassed and finned surfboards can be produced for around \$300.

The following Section 4 shows various examples of student work involved in designing and production of surfboards during a “*Surf Equipment, Design, Materials and Construction*” course.

4. RESULTS AND DISCUSSION: EXAMPLES OF STUDENT WORK ASSOCIATED WITH DESIGN AND PRODUCTION OF SURFBOARDS

Figure 4 shows a set of photographs depicting various examples of student works involved in the design and production of different surfboards. It shows a production flow chart and its sequences, namely, shaping the foam, spraying the foam (and a decorated foam), cutting of fibreglass cloth and laminating the foam, sanding the finished surfboards.



Shaping the foam

Spraying the foam

Decorated foam



Cutting the fibreglass cloth

Gloss coating

Sanding the surfboard

Figure 4 Students engaged in production of surfboards during a “*Surf Equipment, Design, Materials*

and Construction” course in 2003, Courtesy P. Killen.

Figure 5 is a digitally modified photograph showing various ‘as manufactured’ surfboards numbered from 1 to 20 for better identification. These surfboards have a wide range of shapes and design features, each of them representing a unique outcome of Surf Science and Technology in terms of accumulated knowledge and its application. It is evident that the mathematically calculated and precisely shaped modern surfboards demonstrate the quality of high performance surfboard(s) for the experienced designer and user.



Figure 5 Different surfboards produced during a “Surf Equipment, Design, Materials and Construction” course in 2003

From Figure 6 it is evident that 6 students did not decorate their surfboards (6, 7, 11, 12, 17 and 18); 5 students preferred a simple decoration of their surfboards (1, 2, 9, 16 and 19), and the other 9 students heavily decorated their surfboards (3, 4, 5, 8, 10, 13, 14, 15 and 20). The three surfboards marked as 2, 4 and 5 were equipped with a single fin. The one surfboard marked as 19 was a twin fin. All other sixteen surfboards were made as thrusters *ie* three fins. From this it is evident that the thruster is a quite popular design between young surfers. From twenty surfboards the seven surfboards (namely 6, 7, 9, 10, 11, 14 and 20) were a type “Short” surfboards; the two surfboards (namely 17 and 18) bore features similar to both a type “Short” and a type “Fish” surfboard(s); the five surfboards (namely 1, 12, 15, 16 and 19) were a type “Fish”; the three surfboards (namely 5, 8 and 13) were a type “Mini-mal” surfboard; and one surfboard (namely 4) was a type “Malibu” surfboard. One student only made a full size Malibu – about 9’6” - but it isn’t in the photo. Only one board (namely 19) would possibly be regarded as a proper “fish”, the others shown are more likely to be swallow tail shortboards. Two surfboards (namely 2 and 3) are 70’s style (a single fin design), as are another couple of boards which don’t appear! Form this it is evident that a type “Short” and swallow tail surfboards were the most popular and they covered 75% of all ‘as produced’ designs. Other type(s), namely, “Mini-mal”, “Malibu” and “Single” fin design(s) were only marginal.

In April 2004, the third year students were surveyed in order to find what motivated them when selecting their surfboard design features and how long it took to make their surfboard. 11 students responded to the survey, see data in Table 1.

From Table 1 it is evident that the choice of a Type ‘as produced’ surfboard(s) related to various ‘expected’

performance measures, namely buoyancy, turning, paddling and turns. The choice of rail design for a particular surfboard appeared to be influenced by riding ability of its designer. Soft rails were chosen for easier riding and better manoeuvrability while hard rails were preferred for faster riding with less surface tension.

A number of surveyed students decided to make single rail design, medium rails, soft rails and/or hard rails. Some of more experienced students experimented with complex rail designs. Combinations varied from hard rails on tail for faster and less surface tension and soft rails from middle to nose for better manoeuvrability to high rails at nose, mid rails along middle and low rails along tail.

Most of single bottom contours (55%) were those of a concave shape. One student made a combination of concave shapes – single concave shape for the whole surfboard except with slight double concaves after two side fins. One student produced a flat bottom shape for minimum surface contact with the water believing that it would increase speed and reduce manoeuvrability. The same student tried to improve the performance of the surfboard by choosing soft rails for easier riding and rounded pin tail shape for better stability. Some students experimented with combinations of bottom contours *eg* flat and concave shape at nose for nose riding and slight ‘V’ shape for better manoeuvrability.

Tail shapes varied widely. 11 students produced 7 different shapes, namely 2 swallow, 2 rounded pin, 2 rounded square, with the rest one each diamond, all round, swallow with wings, rounded square and square.

Most of fin types (64%) were ‘as bought’ turbo. One student made a ‘fat boy’ type fin for nose riding, one student designed and used a type ‘tuna fish’ fin similar to that of 50’s and 60’s and one student used ‘as bought’ single fin from 70’s. The survey showed that 55% of students made templates for their surfboards by magnifying design features from ‘as published’ surfboard designs in various magazines, 18% of students got the templates from friends or shapers, one student copied the surfboard from an existing surfboard, and 2 students calculated their surfboards for buoyancy. Finally, production took place between weeks 4 and 13 with most starting in weeks 5 or 6 thus the longest time taken for construction was about 9 weeks.

Table 1 Tabulated results of the survey conducted amongst the 3rd year “Surf Science” students at ECU in 2004.

SOME TYPES OF "AS PRODUCED" SURFBOARDS	RAIL DESIGN	BOTTOM CONTOUR(S)	TAIL SHAPE	FIN TYPE	PRODUCTION TIME
Thruster-Fish Design	Medium rails	Concave shape	Swallow	'as bought' Turbo	NA
Center Fin Longboard 9'0 single fin (for small, fat and slow waves)	Soft rails	Flat and concave at nose (for nose riding) plus slight 'V' shape (for manoeuvrability)	Diamond	'Fat boy' (for nose riding)	9 weeks
Thruster-Fish Design	Hard rails	Concave shape (for speed)	all Rounded	'as bought' Turbo	2 months
Two Fins – Fish Design (less critical attention to turning)	Soft rails	'V' shape to get more foam for better floating	Swallow tail with wings	'as bought' Turbo	9 weeks
Thruster-Fish Design (for better performance)	Hard rails on tail (faster and less surface tension) Soft rails from middle to nose (for manoeuvrability)	Single Concave shape with slight Double Concave after two side fins	Rounded and large (more forgiving when turning)	'as bought' Turbo (just following the trend)	20 to 30 hours
Thruster-Fish Design	Soft rails (for easier riding)	Concave shape (good for barrels)	Rounded Square	Own design 'tuna fish' template, a copy of 50's-60's	NA
Thruster-Fish Design, hybrid 6'0	Soft rails (for easier riding)	Flat shape (for minimum surface on the water)	Rounded Pin (for stability)	'as bought' turbo	9 weeks
Three fin longboard Minimal 7'2.5" (for easy to paddle and good turns)	High rails at nose, Mid rails along middle and Low rails along tail	Flat through the middle with slight concave at tail	Square (for aesthetic reasons)	Middle fin larger, 2 side fins smaller for stability	9 weeks
Single fin surfboard	Rails fading from Soft to Hard	Concave	Rounded Pin 70's	'as bought' single 70's fin	weeks
Thruster-Fish Design	Hard rails	Concave	Rounded Square	'as bought' Turbo	3 weeks
Thruster-Fish Design	Mid rails	Concave (traditional proven to work)	Swallow	'as bought' turbo	9 weeks

Another earlier survey was conducted in March 2004 to the same group of the 3rd year students to determine both the qualitative trend and quantitative importance in various criteria describing the surfboard as a whole. The full report is in paper [15]. For the purpose of this paper some data were adopted as follows: 18 people (72% males and 28% females) responded to this survey. 91% of them were younger than 25. The average height and weight of males was $179^{\pm 6.5}$ cm and $75^{\pm 15}$ kg, respectively. The average height and weight of females was $170^{\pm 7}$ cm and $58^{\pm 2}$ kg, respectively. All were active surfers, 33% surfing more than twice a week, and others surfing once or twice a week. On average they owned around 14 surfboards (some of them 2, some of them 50). When surveyed they were asked to choose those criteria they consider to be the most important when buying or designing a surfboard. The criteria were the craft weight, the craft cost, the craft design/shape, the fin design, the number of fins, the craft durability, the craft appearance, the shaper, the surfboard/fin material. To assist in the analysis of the survey sample results, and to provide a quantitative comparison of relative importance of each qualitative criterion with respect to other criteria associated with surfboard design features and performance a statistical method was established. This method was described in paper [15], and as such is not presented here. Statistically it has been proven that the qualitative trend and the relative importance weights in surfboard criteria from the statements of the 3rd year students were: craft cost and craft shape (both 26%), craft weight (17%), number of fins (14%), craft durability (12%), fin design (5%), craft appearance and craft/fin material and craft shaper (0%).

From the above it appears that the surfboard design is a matter of weight, height and physical fitness of a surfer, taste and imagination of a designer, and experience of a shaper supported by the recent knowledge and continuous advances in Surf Science and Technology. This could be a possible explanation why the surfboard design features are in constant evolution. It appears that using qualitative methods of errors and trials it could be possible to make some good improvements in surf design for better surfing performance but it takes time. Moreover this paper indicates clearly that more focus is needed to study and explore potential of various manufacturing processes and materials involved in surfboard production. There is also a clear need for computer modelling and performance prediction to lift the surf science and technology at higher, more advanced level.

CONCLUSIONS:

The most important conclusions derived from this study are summarised as follows:

- 1 Literature survey indicated that the general geometry of a surfboard can be described by nose, body (width, length and thickness), tail, fins, rails, rocker, and bottom contour(s). Their design features were found to vary in a wide range and their selection appeared to be dependent on skill and experience of a shaper.
- 2 A study of commercial surfboards showed that there are 5 major types of surfboards in market, namely 'Fish', 'Short' board, 'Mini-mal' or Fun Board, Mal or Long-board 'Malibu' board and 'Gun' board. The main differences between these 5 types of surfboards were found to be in the length, width and shape.
- 3 Around 95% of commercially produced short boards were designed as 3 fins, the rest, 5%, were twin fins or single fin design. Mini-mal boards were mostly three fins *ie* thrusters. Malibu boards were designed either as single fin boards (~50%) and / or as thrusters with three fins (~50%).
- 4 Various surfboards were produced by the 3rd year students. This indicated that open learning and qualitative education system at ECU created a supportive and friendly environment for enhancing the students' creativity. Type Short were most produced surfboards by about 75% of students. Other surfboards produced on minor scale were Type(s) 'Malibu' and 'Mini-mal'. 80% of surfboards were designed and made as three fin 'thrusters'. Most of these 'as produced' surfboards were equipped

with ‘as bought’ classical Type Turbo fins (64%). The majority of students (55%) used single concave shapes for the bottom parts of their surfboards. The longest estimated production time was about nine weeks.

- 5 Majority of students preferred to design their surfboards according to ‘reported’ designs or from existing surfboards. Only few students decided to calculate their surfboard design features. It shows that there is need for better explanation of potentials the manufacturing processes and materials may have on surfboard performance. Furthermore, there is a need for computer modelling and data base creation that would allow to predict various performance measures of surfboards without need of testing which would lift the surf science and technology at higher, more advanced level and result in industrial collaboration.

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Kappelle, E. Edith Cowan University, Australia. Inappropriate lexico-grammatical choices in Thai EFL expository writing

Abstract: This paper presents an investigation of inappropriate lexico-grammatical choices identified in 118 expository essays from Thai EFL postgraduate writers. These choices were categorized and quantified to ascertain their effect on readers' perceptions of textual coherence. Areas of inexpert lexico-grammatical use which most severely disrupted the readers' processing of text involved, firstly, collocations, i.e. conventional native-speaker word groupings and, secondly, morphological suffixation, particularly the word endings that change the forms of English parts of speech.

INTRODUCTION

The increasing attention currently being paid to lexico-grammatical research in English acknowledges the importance of comprehensive lexical knowledge and the choices of appropriate lexico-grammatical elements in the production of a meaningful and coherent communication. These choices and the way they are patterned not only reflect the communicative purpose of a text and the cultural concepts shared by the speech community of a writer but also facilitate the creation of textual *cohesion* and *coherence*.

For example, *cohesion* 'concerns the ways in which the components of the surface text are mutually connected within a sequence' (Carter 1987, p. 87), i.e. the relationships between words, whereas a text is considered to be *coherent* when 'a reader understands the function of each succeeding unit of text in the development of its overall meaning' (Wikborg 1990, p. 133); in other words, the organization and development of information should enable the reader to easily follow the writer's progression of the discourse theme. The evaluation of textual coherence or otherwise by the reader thus depends to a large degree on the success with which the writer's lexico-grammatical choices clearly express communicative intention and meaning.

This paper presents a detailed examination of the inappropriate choices of lexico-grammatical units identified from a larger investigation into coherence breaks in 118 expository essays written by 32 Thai EFL postgraduate students. A coherence break is defined in this paper as an interruption to the reader's 'smooth processing of the flow of information in a text' (Wikborg 1990, p. 133).

The issue of lexico-grammatical choices in the context of academic writing research relates not only to choices from traditional word classes such as nouns, verbs, adjectives and adverbs but also to the choices of multiword items and patterns. Conventionalised multiword combinations known as *collocations* can be defined in a general sense as 'groups of words that occur together' (Celce-Murcia & Larsen-Freeman 1999, p. 44). Such co-occurrences of particular words that appear in familiar patterns are also referred to as *ready-made*, *formulaic* or *prefabricated language (prefabs)* (Cowie 1998; Granger 1998; Pawley 2000). Research has shown that knowledge of these ready-made patterns is crucial to native speaker fluency and coherence. Many collocations also function in native speaker communication as idioms and catchphrase; for example, *in the nick of time*, and *break one's journey* (Cowie 1998, p. 4). Cowie (1998) makes the strong claim that the study of word combinations, i.e. *phraseology*, is now one of the most important areas of research in pure and applied linguistics.

Vocabulary has traditionally been divided into two word classes:

1. The major word classes which are described as *open* class words and consist of *lexical* or *content* words; e.g. nouns, verbs, adjectives, and adverbs;
2. The minor word classes which are described as *closed* class words and consist mostly of *grammatical* words; e.g. prepositions, inter-clausal connectives, pronouns, determiners, quantifiers, numerals, ordinals, auxiliaries and interjections (Givon 1993).

Open class words are subject to change due to new lexical items being introduced into language while *closed* class words tend to remain relatively fixed as part of the syntax of language (Howarth 1998). Singleton (1999) maintains that the distinction between lexicon and grammar is difficult to identify in multiword items and patterns as they include large numbers of both *lexical* and *grammatical* collocations, each of which sometimes appears to possess characteristics of the other. For this reason, researchers like Halliday (1994) and Celce-Murcia and Larsen-Freeman (1999) perceive grammar and lexicon as opposite ends of a continuum, thus preferring to think in terms of *lexico-grammar* as a framework to describe vocabulary usage.

The identification of lexico-grammatical errors in written language is not easy. Much depends on the degree to which the analyst understands what the writer has meant to say and whether the error is of a *lexical* or *grammatical* type. This is especially relevant in collocational use. An important distinction between *lexical collocations* and *grammatical collocations* is made by Howarth (1998) who investigated *phraseological competence* in native and non-native English speakers' writing. He states that lexical collocations consist of at least two *open* class words, such as *verb + noun*, e.g. *adopt a policy*, or *adjective + noun*, e.g. *an aquiline nose*, whereas grammatical collocations combine an open class word with a closed class word, often a preposition, e.g. *an argument about* (Howarth 1998, p. 163). Some collocations are more restricted or fixed than others in terms of vocabulary items that are substitutable. Thus, Howarth (1998) suggests a *collocational continuum* that includes conventional word groupings ranging from those in which items are relatively freely substitutable to those in which the substitution of items is severely restricted, e.g. idiomatic expressions.

Howarth (1998) explains that in *free collocations*, lexico-grammatical items such as *blow a trumpet* are used their literal sense and can be substituted by numerous other items whereas *restricted collocations* such as *blow a fuse* are word combinations where 'the sense assigned to one partner is "bound to" or governed by its association with another word or phrase' Pawley (2000, p. 4) and thus less open to substitution by other items. For example, tertiary writing frequently requires restricted collocations drawn from the academic register such as *set out criteria*, *reach a conclusion*, *adopt an approach* (Howarth 1998, p. 34). Restricted collocations are also considered a particularly rich area in terms of cultural influences so that cultural meanings must be considered in any account of a communication's phraseological features (Teliya, Bragina, Operina & Sandomirskaya 1998). For instance, cultural influences are exemplified in the figurative idiom *blow your own trumpet*, meaning *to praise one's own abilities* and the pure idiom, *blow the gaff*, meaning *to reveal a secret*. These idioms need to be interpreted on the basis of the expression as a whole rather than its individual words. From his research into collocational use, Howarth (1998) concluded that the greatest challenge for teachers and linguists exists in the area of restricted collocations i.e. 'differentiating between combinations that are free and those that are somehow limited in substitutability' (p. 42). This conclusion was supported by Pawley (2000, p. 12) who acknowledged that 'no absolute boundary can be drawn' between free combinations and restricted collocations. Nevertheless, Howarth's categorization of collocational types contributes significantly to the EFL/ESL teacher's armoury for detecting and classifying learners' lexico-grammatical problems.

The importance of highlighting word groupings in a language learning syllabus is also acknowledged by Lewis (2001) who emphasizes the crucial role of examining co-text and large chunks of discourse in the teaching and learning of lexis. This approach recognizes and treats not only frequently occurring word patterns but also collocational use of semantically powerful words, and institutionalized multi-word units, all of which are important for communicative competence. The importance of these patterns in the construction of sentences can be seen especially in the *given-new* relationship where a writer first presents information that is already known in order to prepare the reader to accept new information more easily (Chafe 1994). If the writer's communicative competency does not allow the clear expression of the given-new relationship, readers may fail to satisfactorily follow the discourse theme and to make the semantic connections necessary to fully comprehend the text message.

Within grammatical collocations, difficulties for EFL/ESL learners can include the appropriate choices of prepositions. According to Diller (1988), such difficulties encountered by Thai learners may be attributed to differences between Thai and English regarding the roles of prepositions. For example, some prepositions are used in formal written Thai to indicate the *functions* of open class words but writers have the option to use prepositional markers or not for other relationships. However, English prepositions are frequently described as *connectors* between lexical items (Warotamasikkhadit 1988) as well as markers of functional relationships (Celce-Murcia & Larsen-Freeman 1999). They often involve some of the most commonly used prepositions, such as the preposition *to* that typically signals and connects spatial relationships, e.g. *go to the movies*, but that can also signal non-spatial relationships such as time, e.g. *a quarter to eleven* and degree, e.g. *He is wise to that extent*. (Celce-Murcia & Larsen-Freeman 1999, p. 411)

Co-occurrence restrictions involving preposition use also ensure that certain lexical items are always accompanied by a particular preposition, either before or after the lexical item, or both; for instance: *to rely on X*, *in my opinion*, *in lieu of* (Celce-Murcia & Larsen-Freeman 1999, p. 34). Furthermore, many phrasal or two-word verbs such as *get on*, *call on*, *object to* have single word synonyms such as *board*, *visit*, *protest* which do not habitually take a specific preposition. However, a transfer of prepositional use from the phrasal verb often results in a syntactic error such as *he boarded on the plane* (Martin 1984, p. 132).

Nation (1990, p. 33) refers to the mnemonic effort required to learn and remember individual lexical items as 'the learning burden of a word'. He states that the heaviness of this burden is dependent on three factors: firstly, the learner's first language and previous experience of English, secondly, the way in which the word is learned or taught and, thirdly, the intrinsic difficulty of the word, such as its length, frequency of occurrence and register type. In addition, learning to write in a language with a different orthographic system is more difficult than learning to write in a language with a similar orthographic system. For example, the Thai and Roman scripts differ so that the learning burden will be heavier for both Thais learning English and English speakers learning Thai.

Further lexico-grammatical difficulties for EFL/ESL learners include the affixation of morphemic features, a productive word formation process. A *morpheme* is the smallest meaningful unit in the grammar of a language and can be divided into two basic categories: freestanding words and morphemes that are bound or affixed to other words. Each of these categories is subdivided into two kinds: those with lexical content and those that function grammatically. The freestanding lexical morphemes correspond to the category of *content* words and form the major parts of speech: nouns, verbs, adjectives and adverbs. The freestanding grammatical morphemes correspond to the category of *grammatical* words such as articles, prepositions and conjunctions.

Bound morphemes are also divided into two types: derivational and inflectional. Morphological derivational affixes can be described as prefixes and suffixes that combine with base (stem) forms to derive new words (Celce-Murcia & Larsen-Freeman 1999). Prefixes usually change the lexical meaning of the same part of speech, e.g. *successful* can become *unsuccessful*, while suffixes usually change the part of speech in a particular word family; e.g. *happy* can become *happiness*. The affixation of an inflectional morpheme when conforming to grammatical requirements results in a different word form without changing its part of speech; for example, when *watch* becomes *watching* (Celce-Murcia & Larsen-Freeman, 1999:31).

The production of different word forms derived from a particular word family frequently cause difficulties for learners from a language background such as Thai. Firstly, Thai speakers are unfamiliar with the morphemic prefixes and suffixes used by English speakers to change word forms in the same word families, (Diller 1992), e.g. *un + happy = unhappy*, *happy + ness = happiness*. A word family can be described as a base word, e.g. *stimulate*, with the addition of morphemes to show verb tense or number, e.g. *stimulated*, *stimulates*, or parts of speech derived from the base word, e.g. *stimulating*, *stimulation*, and *stimulant* (Schmitt & McCarthy 1997, p. 331). Secondly, some confusion may result from the lack of syntactic distinction in Thai between the categories of adjectives and adverbs (Diller 1988). To investigate usage of the appropriate derivatives in the four major word classes of noun, verb, adjective and adverb, Schmitt & Zimmerman (2002) tested 106 graduate and undergraduate non-native English-speaking students. Results showed that only 18.2% of the students displayed facility with the derivatives of all four major word classes. The more difficult derivational forms for these particular students appeared to be those of adjective and adverb. Schmitt & Zimmerman postulated that ESL learners may experience problems with lexical acquisition not only because of difficulties with derivational forms but also because of a perceived lack of necessity to include new derivational forms in their active vocabulary, particularly if they are communicating satisfactorily with a restricted vocabulary. This can contribute to a plateauing effect in their lexical acquisition.

Noun compounds are further examples of productive processes of word formation. Noun compounding is the combining of existing words resulting in a new lexical unit, e.g. *rain + coat = raincoat* (Celce-Murcia & Larsen-Freeman 1999, p. 35). Many parts of speech can be used to modify nouns in the formation of a noun compound; e.g. '*noun + noun = stone-wall*, *adjective + noun = greenhouse*, *preposition + noun = overlord*' (Celce-Murcia & Larsen-Freeman 1999, p. 35). However, a noun compound cannot always be understood as a single concept by analyzing its component parts. For example, a travel book is a book about travel but a telephone book is not a book about telephones (Trimble 1985). Thai language consists of many noun compounds but transfer of noun compounding strategies from Thai to English by EFL/ESL student writers does not necessarily yield acceptable native-speaker wordings. Furthermore, many compounds are formed from inappropriate *nominalizations*. *Nominalizations* from vocabulary classes such as adjectives, verbs and adverbs can be a *lexical* process through which a verb or an adjective becomes a noun, e.g. *he was civil to employees* becomes *his civility to employees* (Givon 1993, p. 290) or it can be a *syntactic* process through which a verbal clause or a verb phrase becomes a noun phrase, e.g. *he traps beavers* becomes *he is a beaver trapper* (Givon 1993, p. 261). Nominal complexity is found in many types of formal writing; for example:

thePanama invasion surprise decision (Givon 1993, p. 247).

Here, *decision* is the main subject word and *Panama*, *invasion* and *surprise* are nominalized modifiers of *decision*. That is, *invasion* is nominalized from its verbal form, as in the *decision to invade* and *surprise* is nominalized from its adjectival form, as in the *surprising decision*. e.g.

Such nominal complexity in English found in the technical jargon associated with some academic disciplines is similar to the frequent use of nominalizations as technical terms in formal modern Thai (Prasithrathsint 1996). The most frequent Thai nominalizers are the morphemes *kaan* and *khwaam* which are broadly equivalent to English nominalizing suffixes such as *-(t)ion*, *-ment*, *-ance*. The *kaan* morpheme represents work, affairs, and matters, such as *kaan-kin* 'eating' (*kin* meaning 'eat'), while *khwaam* represents abstraction, such as *khwaam-dii*, 'goodness' (*dii* meaning 'good') (Prasithrathsint 1996, p. 1206). Although *kaan* and *khwaam* nominalizations have been used for centuries as part of formal registers, 'frequent use of them is often criticized by Thai language authorities' (Prasithrathsint 1996, p. 1207) who maintain that genuine Thai language should be brief, simple and concise and that nominalization is unnecessary elaboration. Diller (1988) also comments that the nominalizing process in Thai contributes to 'dense sentential complexity in traditional written sources' (p. 292).

The following sections describe the in-depth examination of inappropriate lexico-grammatical usage in the research essays.

METHOD

Inappropriate lexico-grammatical choices were identified as coherence breaks in a first reading of the 118 essays. Those choices that interrupted the reader's processing were marked and listed in preparation for an in-depth analysis using categories drawn from Howarth (1998), Celce-Murcia and Larsen-Freeman (1999) and Pawley (2000). Following these classifications, as part of a further refining process, collocational patterns identified as inappropriate in conventional native speaker usage were examined to determine their phraseological categories, as well as their degree of departure from native speaker selection patterns. Howarth's (1998) distinctions between lexical and grammatical collocations described earlier in this paper were used for this finer analysis.

FINDINGS

Inappropriate lexico-grammatical choices were found in the work of all 32 students (100%) in this study. The categories of inappropriate usage are listed hierarchically in Table 1, from the largest number of students who made the choices to the smallest.

Categories associated with inappropriate lexico-grammatical choice	No. of instances	No. of students (n=32)
Free lexical collocations	101	29 (90%)
Parts of speech	126	25 (78%)
Restricted lexical collocations	84	25 (78%)
Preposition use in grammatical collocations	63	25 (78%)
Noun compounds	36	20 (62%)

Table 1 Categories and instances of inappropriate lexico-grammatical choices and the number of students involved.

The above table shows that 29 of 32 students, (90%), were responsible for 101 coherence breaks associated with inappropriate lexico-grammatical choices in the category of free lexical collocations; i.e. an average of almost 4 instances per student. Twenty-five students, (78%), were responsible for the highest number of coherence breaks (126) relating to parts of speech. These figures indicate that some students produced multiple numbers of the same error. There were 84 instances of coherence breaks associated with the category of restricted lexical collocations and these were found in the essays of 25 (78%) students, an average of over 3 per student. Furthermore, incorrect use of prepositions in

grammatical collocations caused 63 instances of coherence breaks in the essays of 25 students (78%) while problems with English noun compounds were responsible for 36 instances of coherence breaks in the work of 16 (50%) students.

The findings thus highlighted two significant areas of underdeveloped linguistic competence in the case of the EFL student writers involved in the study:

1. *Conventional phraseological usage*. This area of language is idiomatic in the sense that it exhibits characteristic patterns of expression relating to English native speaking usage. Phraseological usage causing coherence breaks included free lexical collocations, restricted lexical collocations, and prepositional use in grammatical collocations.

2. *Morphological derivational suffixation*. The suffixation of morphological features to change word forms in the four major word classes comprising nouns, verbs, adjectives, and adverbs caused coherence breaks resulting from, firstly, the use of parts of speech associated with the incorrect selection of word forms for a particular syntactic environment and, secondly, unconventional noun compounding

(see Table 2).

Conventional phraseological usage	Morphosyntactic derivational suffixation
Free lexical collocations	Parts of speech
Restricted lexical collocations	Noun compounds
Prepositional use in grammatical collocations	

Table 2 Areas of lexico-grammatical usage associated with coherence breaks

These categories are now discussed in detail.

Conventional phraseological usage

Categorization judgements relating to the phraseological categories shown in Table 2, i.e. free lexical collocations, restricted lexical collocations and grammatical collocations, were made on the basis of native speaker estimates of the numbers of substitutable words available to render the expression conventionally acceptable; i.e. assessments of the degree of formulaic fixedness in a particular instance. The results demonstrate that unskilled creation of phraseology significantly disrupted the reader's processing of text. This finding emphasizes Howarth's (1998) comment that non-conventional collocation destabilizes word combinations, and the processing of text is slowed if the reader is forced to refer to the context to ascertain intended meaning.

Free lexical collocations

Table 1 showed that 90% of the study's participants were responsible for coherence breaks associated with free lexical collocations. These coherence breaks were found in two types of structures:

1. *Verb + Noun*. This part of a conventional clause or sentence structure represents the core proposition being advanced (Howarth 1998) and often includes new information being introduced to the text. In such cases, mismatches of meaning between verbs and nouns in these structures can cause reading difficulties related to thematic continuity in sentences and paragraphs. For example:

Lastly, many countries strive to be industrial country. Therefore, they bring their resources such as forests, oil and minerals but they are carelessly in use.

Here, the verb *bring* + the noun phrase (NP) *their resources* represent the core proposition in this clause and also introduce new information. They are thus central to the construction of the thematic argument being developed in the paragraph. However, *bring* can be defined as *causing to come*, a meaning which does not make sense in this sentence.

2. *Noun + verb*. These clause or sentence elements represent the thematic starting point of a clause that frequently incorporates previously given information, contributing to continuity of topic across sentences. Mismatches between noun and verb interfere with this continuity. For example:

In the globalisation, the development of cities investigate to the advance in socio-economy.

Here, the NP, *the development of cities* is a semantic mismatch with the verb *investigate* that collocates only with animate subjects or those collective nouns that represent groups of animate subjects, such as *committee*, *Royal Commission*, *football club*. Thus, its inappropriate use here with the inanimate noun *development* leaves the reader uncertain of the writer's progression of the topic.

Restricted lexical collocations

As previously explained, restricted lexical collocations are open class word combinations in which partnerships between specific lexical items form part of conventional usage by native English speakers and, in which, substitutable items are much more limited in number than in the case of free lexical collocations. Restricted lexical collocations pose particular problems for EFL/ESL writers for two main reasons. Firstly, the meaning of the word combinations as a whole frequently do not correspond to the meanings of the individual components. Secondly, most restricted collocations contain a cultural component that is often not easily understood by learners from other cultural backgrounds.

Inappropriate lexico-grammatical use associated with restricted lexical collocations occurred in 84 instances in essays written by 25 (78%) students. Some examples from students' essays are:

1. *For example, they can take their children and wife to go to the beach that is far from their home, to go to aboard.*
2. *If we want to know about the young girl, we can see her mother.*
3. *People who live in the noisy areas will get the problem of the listening system.*

In the first example, the conventional collocation *to go aboard*, i.e. *to board a ship*, seems to have been confused with the formulaic expression *to go abroad*, i.e. *far from home*. Furthermore, an unnecessary preposition has been added into the collocation. Orthographic problems may also be factors here; i.e. similar word forms are easily confused when learners come from a different orthographic background, such as in the case of Thai. The second example shows a restricted collocation that is towards the free end of the restricted category in Howarth's (1998) collocational continuum. The meaning of this sentence seems similar to the relatively common English saying: *like mother, like daughter*. A native speaker would probably use verbs such as *look at*, or *study* to indicate an assessment of the mother's characteristics, rather than *see*.

The third example above shows the use of words in a specialized sense, specialized words being one of Howarth's (1998) criteria for categorizing collocations according to their degree of restrictedness; e.g. sensory systems and parts of the human body are referred to with specialized language by medical and biological professionals, as well as laymen. In the example above, specialized language by native speakers

in such a context would include *our hearing system* or *the auditory system* rather than the expression *the listening system*. epositional use in grammatical collocations.

Grammatical collocations, as defined earlier in this paper, are combinations of open class or content words and closed class or grammatical words that belong together by grammatical necessity. The study findings revealed that the incorrect use of prepositions in grammatical collocations resulted in 67 coherence breaks involving 25 (78%) students. These coherence breaks were associated with firstly, combinations of verb + preposition and, secondly, noun + preposition + noun (see Table 3).

Inappropriate prepositional use in grammatical collocations	Instances	Students (n=32)
Verb + preposition	53	23
Unnecessary use	23	18
Incorrect use	20	10
Noun + preposition + noun	14	9

Table 3 Inappropriate prepositional use in grammatical collocations

Verb + preposition

Table 3 shows that 53 instances of verbs followed by inappropriate prepositions were present in 23 (72%) students' work. These instances fell into two categories: *unnecessary* use and *incorrect* use of prepositions. Firstly, the *unnecessary* use of prepositions involved the addition of prepositions to verbs that do not require a preposition and appeared in 33 instances in essays by 18 (56%) students: e.g.

A good income would cause of happiness.
There are three reasons concern with people to describe about this agreeeness.

In the first example, the verb *cause* is a transitive verb, requiring a direct object, with no prepositional use. The unnecessary preposition in this example may indicate uncertainty regarding prepositional use with transitive and intransitive verbs. It may also indicate confused use with the noun and verb forms of *cause* as the noun *cause* can take the preposition *of*; e.g. *A good income would be the cause of happiness*. The second example shows the unconventional use of the preposition *about* with the transitive verb *describe*. This usage may reflect confusion related to the syntactically correct use of *about* with the intransitive verb *talk*; e.g. *talk about*.

Secondly, *incorrect* combinations of verb + preposition were found 20 instances in the essays of 10 (31%) students. Examples from the essays are:

This results of making understanding.
Its effect impacts to respiration.

The preposition *of* in the first example is incorrect because the verb *results* conventionally co-occurs with the preposition *in*, not *of*. However, the noun *results* can co-occur with the preposition *of*; e.g. *the results of the examination*. The second example shows the incorrect combination of *impact* + *to* instead of the conventionally co-occurring items *impact* + *on*.

Noun + preposition + noun

Table 3 also showed 14 coherence breaks identified in the essays of 9 (28%) students, resulting from unconventional combinations of noun + preposition + noun. For example:

According to the Ministry of Public Health, the number of patients who have problems about respiratory systems is gradually increasing.

This sentence shows the inappropriate use of the preposition *about* to connect *problems* and *respiratory systems*, thus suggesting that patients have problems in terms of what respiratory systems are or what they do. However, the paragraph context makes it clear that the student wanted to focus on air pollution resulting in health problems *involving* the patients' respiratory systems.

Morphological derivational suffixation

Some coherence breaks appeared to be associated with two kinds of productive processes of word formation. Firstly, problems involved morphological derivational suffixation associated with incorrect use of the appropriate word forms for particular parts of speech (the four major classes of lexical items, i.e. nouns, verbs, adjectives, and adverbs) and, secondly, unconventional noun compounds were formed from syntactically and semantically incorrect nominal forms.

Parts of speech

Table 1 showed that 126 instances of incorrect use of parts of speech by 25 students appeared to relate to uncertainty about the correct word form usage derived from particular word families. Table 4 below shows, firstly, the number of coherence breaks related to the incorrect use of word class forms in environments where a member of another word class would be expected; e.g. a coherence break involving an adjectival form appearing where a noun form would be expected was recorded as a coherence break associated with the class of nouns. Secondly, Table 4 shows the number of students whose writing displayed instances of such incorrect usage.

Incorrect use of major word class forms	Nouns	Verbs	Adjectives	Adverbs
Coherence breaks associated with each word class	64	10	62	5
Number of students (out of 32) using word classes incorrectly	21	7	22	4

Table 4 Incorrect use of word class forms and number of students involved.

The above table reveals that the largest number of coherence breaks occurred where nouns and adjectives were required, i.e. 64 instances of incorrect noun forms from 21 (64%) students and 62 instances of incorrect adjectival forms from 22 (69%) students. Incorrect use of verb and adverbial forms appeared in lower numbers, with only 10 instances of incorrect verb forms from 7 students and 5 instances of incorrect adverbial forms from 4 students. For example:

1. *The first effect is about healthy.*
2. *Secondly, the car have had important in my lives because we can use many things from it.*
3. *Moreover, a growth number of people in the cities has caused the traffic congestion which is the reason for air pollution.*

4. *Thus, studying of pollution is very importance.*
5. *It is the most important and easily way to communicate with each other and retrieve more information.*
6. *Having perfectly health is the wish of everybody.*

Sentences 1 and 2 show the adjectival forms of particular word families incorrectly used instead of noun forms, e.g. the first example would be syntactically correct if the noun form *health* had been used or even if the present participle *being* had been added to form the gerund: e.g. *being healthy* (gerunds are verbs used as nouns, e.g. *Swimming is good exercise*). The second example needs the noun form *importance* rather than the adjectival form *important*. Sentences 3 and 4 show noun forms used where the adjectival form would have been expected, e.g. sentence 3 requires the adjectival form *growing* rather than the noun form *growth* while sentence 4 requires the adjectival form *important* not the noun form *importance*. Sentences 5 and 6 show adverbial forms with the suffix *-ly* being used instead of the expected adjectival forms.

Overall, only 4 (12.5%) of the 32 students made no errors of this kind, consistently using the appropriate word form for each particular syntactic environment, whereas 28 (87.5%) students appeared to have only partial understanding of the correct use of derived forms in the four major word classes.

Noun compounds

Compounding can be described as a productive word formation process that combines lexical items 'to form a new lexical unit' (Celce-Murcia & Larsen-Freeman 1999, p. 35). Noun combinations producing unconventional lexical units in this study were responsible for 36 instances of coherence breaks in the essays of 20 (62%) students and appeared to result partly from inexpert use of nominalizing processes and partly from syntactically incorrect parts of speech:

1. *Happiness people means people who have good families, good friends, good health and so on.*
2. *High education parents can teach children, they are support children knowledge, these improve good attitude.*
3. *Instead a good income tends to cause anxiety and a never-ending cycle of income chase.*

The first sentence shows the nominal form *happiness* instead of the adjective *happy* used as a modifier of the headword *people* to form an inappropriate noun compound. In this instance, *Happiness* may have been nominalized from *happy* for style and register reasons (Prasithrathsint 1996) or it may result from uncertainty regarding correct usage of the forms of different parts of speech. The second sentence similarly shows an adjective and a noun, *high education*, inappropriately compounded as a modifier with the noun *parents*. Conventional use would have included an adjectival phrase, e.g. *highly educated*, or a relative clause, *Parents who are highly educated*. In this case, therefore, as possibly in the first example, the writer may have adopted the Thai pattern of nominalizing a word from another word class or part of a sentence as a stylistic mark of the written academic register. The third example shows an incorrect compound involving two nominal forms, *income* and *chase*. Here, the anomalous compound may result from incomplete knowledge of gerund forms; i.e. the word form *chasing* would have been more appropriate. Native speaker usage in this instance would probably include gerunds such as *chasing income* or *income chasing*.

As these examples indicate, such unconventional compounds do not generally produce semantic dissonances severe enough to obstruct comprehension of the text. Nevertheless, compounds such as these did cause interruptions to text processing, interfering with a perception of textual coherence.

DISCUSSION

The large number of coherence breaks in this study associated with the use of multiword units, including both free and restricted lexical collocations, revealed the extent of the student writers' underdeveloped

competence in English phraseology. Native speakers have an implicit recognition of conventional phraseological usage that is gained from hearing and speaking their first language from birth and can generally be creative in using word groups, many of which are wholly or partly memorized, without compromising meaning. Once a word is selected, a limited number of often repeated lexical patterns become available for use with that word, while other patterns are rejected (Pawley 2000). However, EFL/ESL learners do not quickly or easily develop facility with such patterns, especially those involving the linguistic constraints on conventionally collocated items. These patterns require specific teaching as well as wide and continuous exposure to the target language through extensive reading.

The results also support Howarth's (1998) contention that competent use of lexical collocations is more difficult for writers than grammatical collocations. Lexical collocations comprise many more combinations that need mastering than grammatical combinations and are not learnable via the use of prescriptive rules but are absorbed gradually into the store of linguistic items that contributes to a speaker's linguistic competence. Factors causing difficulties with these collocations may result from, firstly, a lack of exposure to the way conventional native speaker multiword units are structured and, secondly, from limited knowledge of English lexical items, thus restricting writers to only those commonly used words which are familiar but not necessarily collocationally compatible in specific environments. Restricted lexical collocations, on the other hand, are formulaic in nature and, therefore, need committing to memory, and are often culturally based (Teliya et al. 1998). Unconventional structuring of both free and restricted lexical collocations tends to not only cause the reader to experience an initial coherence break when the word combinations fail to 'work' but also deflects attention away from the message content to the message form.

The findings also revealed confusion regarding English prepositional usage in grammatical collocations. Many EFL/ESL students from different language backgrounds admit difficulties with the use of English prepositions, particularly as native speakers frequently vary prepositional use in expressions with the same meaning; e.g. "going out *to* lunch", and "going out *for* lunch" (Celce-Murcia & Larsen Freeman 1999, p. 401).

The finding that many coherence breaks in the students' essays resulted from the inappropriate use of English parts of speech correlates with the findings reported by Schmitt & Zimmerman (2002) that few students showed facility with all the word forms in the four major word classes. However, whereas Schmitt & Zimmerman's research included students from different first language groups, all the participants in this study were Thai first language speakers. Derivational morphemes are likely to pose greater difficulties for Thai students than students from European language backgrounds as the morphological suffixation to change word forms in the major word classes is an unfamiliar process in Thai (Diller 1992). Uncertainty with adjective/adverb usage (Diller 1988) was also a significant source of coherence breaks, as adverbial forms, particularly those with the *-ly* suffix, were frequently used in place of adjectival forms. A contributing factor may be that the *-ly* suffix is 'frequent, regular and transparent' (Schmitt & Zimmerman 2002, p. 153) in English. Another contributing factor may be that *-ly* functions occasionally as an adjectival ending, e.g. as in *friendly* and *neighbourly*. It appears desirable, therefore, that derivational morphological suffixation is a priority teaching area for instructors of Thai EFL/ESL students.

Interlingual transfer appears to have influenced many of the lexico-grammatical choices made by the Thai student writers, especially in the areas of prepositional use in grammatical collocations and morphological derivational suffixation. This influence is also evident in the findings relating to unconventional noun compounding and nominalization processes.

As a result of these findings, it is suggested that the treatment of all types of word groups in the teaching of lexis takes place within the context of paragraphs and the discourse as a whole so that the influence of phraseological proficiency on both the continuity of topic on paragraph and sentence levels, as well as the reader's perception of coherence, is apparent. To further assist the development of lexico-grammatical competence, teachers can encourage extensive reading within the students' respective disciplines as well as the maximization of all available linguistic resources. It is also recommended that teachers address the lexical difficulties of students within a framework of knowledge of the socio-cultural and linguistic features of their students' language backgrounds.

SUMMARY

This paper has focused, firstly, on the significance of inappropriate use of conventionalised multiword phrases (phraseology) in the study, bearing in mind the importance of free and restricted lexical collocations, as well as grammatical collocations, in native speaking linguistic competence. Secondly, the paper has highlighted the incorrect usage of productive derivational processes involving the formation of English parts of speech, as well as nominalized word forms contributing to unconventional noun compounds. These findings reflect the daunting task faced by EFL/ESL students in achieving mastery not only of the forms and meanings of individual words, but also of the multiword units that constitute such a large part of native speaking English communication.

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Kutieleh, S., and Morgan D.L. Flinders University,, Australia. Accommodating difference: A prescriptive response to the academic writing needs of students from non-Western cultures in Western higher education settings.

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This paper argues that a prescriptive approach to teaching academic writing best accommodates the contextual modes of thinking with which many non-Western students apply within Western education settings. Despite an abundance of material designed to develop writing skills, none approach written communication from the viewpoint of non-western perspectives. In response, the authors' have developed an approach that addresses many of the issues that these students face when writing formal English for academic purposes. The process involves a tripartite approach that progresses through a series of organic stages that enable students to engage proactively in the production of academic writing. The approach develops a template of writing behaviours that a student can apply to their own particular writing circumstances which articulates through three stages. The prescriptive process allows these stages to be self identified and thus the student can seek assistance and be easily supported by learning support staff and academic advisers and directed to subsequent stages as appropriate. The approach is a stepwise process that increases the students' confidence in their ability to write academic English as they progress through the incremental stages.

The following approaches were developed to assist students from non Western higher education systems who may be familiar with English language constructs but may be less familiar with formal academic English. Most of these students had successfully undertaken tertiary studies in their home countries but were floundering in their studies in Australia because their English was not 'academic'. When questioned as to what makes a particular piece of written work 'academic', most educationalists are unable to define what it is, but many say that they can recognise it when they see it. Such responses are insufficient to address the concerns of students, do not assist their academic writing nor enhance their academic performance. Often issues with written expression are perceived by educationalists as being language related and, as the *lingua franca* of Australian universities is English, this becomes a problem pertaining to the student rather than the educator. However, with tertiary education becoming an increasingly global commodity there is an economic imperative driven by the increasing reliance upon funds injected by international students into tertiary education (Morgan and Kutieleh, 2004). Within this environment there is an increased expectation from these students that the Australian tertiary education system support their ability to realise their full academic potential (Kutieleh, Morgan & Egege, 2004).

Those students who are less familiar with English language structure and use, such as the many international students in the Australian tertiary education system, often perform poorly as a result of their inability to express their ideas in English. They are further intimidated by the reading loads required for some topics and the amount of assessable written work. Thus it is not surprising that many find their

Australian university experience daunting. Nor is it helpful in these circumstances to respond to writing problems by increasing reading loads - suggesting additional reading will overcome deficiencies is unlikely to be productive. By the time they present for academic writing assistance, they are already experiencing pressure from performing poorly on assessable work and often aggravated by deadlines approaching. Many of these students have been accepted into study on the basis that their English language skills were adequate and many have assumed a substantial financial burden in undertaking their studies. Given the stress that these students experience as a result of their 'deficiencies', a prescriptive, concrete approach is required that can scaffold and enhance their academic abilities.

Contextual approaches to writing academic English address many of the issues experienced by non-English speaking students (Morgan & Kutieleh 2004). They are underpinned by the philosophy that learning occurs when the learner is receptive and willing to apply them to actual academic work (Crotty 1998; Hay Bochner, & Dungy 1997; Print, 1988). These approaches involve a process of establishing what is known then providing a support scaffold to identify and resolve the unknown. These approaches break down the task of academic writing into a series of steps that the student can identify and resolve (initially with assistance). They offer an organic approach to academic writing that builds the capacity of students to produce a finished piece of work through a series of successive iterations.

The three approaches, presented below, are advocated for use by academic support staff to address academic writing problems that are ideally suited to those who are less familiar with formal English language (Morgan & Kutieleh 2004). These provide a tool for academic support staff to engage students in the writing process that presupposes no prior knowledge of academic writing, and does not require additional reading, only a reordering of the students' approach to writing. The student's competency will determine the level and stage of the approach applied. In the first, the stated and un-stated rules of academic writing are explicated. In the second, the communication component of the writing (is the message clear, consistent and does it answer the question?) addressed. In the third approach, a 'check sum' for academic writing is outlined for the student to apply to their writing to ensure it conforms to academic standards (Morgan & Kutieleh 2004).

Stage 1: The rules for academic writing

For those inculcated in the Western academic tradition, the requirements of written communication appear obvious. However, these are less clear to those from other cultures. Many international students may have sound written communication skills in their own language but find the expectations of writing in the Western context difficult to meet (Fox, 1994). For those who come from different academic traditions, the assumptions that underpin academic writing are as foreign to them as the language itself (Valdes, 1994). The following approach makes no such assumptions in addressing deficiencies in academic writing skills and reflects more non-Western contextualised approaches to learning (Hall, 1981). It is a prescriptive approach that gives students a sense of certainty that their problem can be addressed (Kutieleh, Egege, and Morgan, 2004). It is advocated that students are introduced to the following steps:

Context

For those from non-Western academic traditions, the academic environment is often alien and unfamiliar (Fox, 1994). Students from the Asia Pacific region use styles of learning which are less objective than those used in Western systems (Hall, 1981; Morgan and Slade 1998). To address this, students need to be made aware that the academic environment is not context free - papers and essays are major tools used to assess competency with the content of topics and courses. The content of written work should reflect the context in which the paper is set (Print, 1988). Set assignment questions are usually structured to address a particular area or issue relating to the content of a topic or course. The written work is in essence a structured form of communication (a natural process of human interaction) that is designed to elicit the

student's competency in the subject matter (Print, 1988). Students need to be clear that academic communication has rules that need to be observed and that the context underpins the content of written work. The context may appear obvious to those familiar with the cultural environment but for those less familiar, it is often overlooked. A demonstration of understanding in this area will emphasise the use of subject area terminology, including any definition of terms that are used with their attendant explanations.

Addressing the question (getting started)

As the questions set for students occur in a context that is designed to focus their attention on addressing key issues in their area of study, the student needs to understand what is required of them. The terms used in paper questions have specific meanings and these should be adhered to in framing the response. The most important aspect of academic writing is an understanding of what is required - clarification should be sought if there is doubt.

Memory dump (mind mapping)

The perceptions that students' have about an issue do not occur in a vacuum nor are they value free. One major purpose of academic writing is to present a balanced, objective viewpoint to enable students to understand their own predispositions before they can achieve the objectivity required of academic writing. A memory dump is a useful tool to establish this. It allows the student to outline the known in relation to the context of the paper and assist them in the construction of the background of their academic work. This process is designed to make the students' thoughts central to the production of their written work rather than it being a regurgitation of the literature or other people's work. During this process, they brainstorm and make short notes or dot points about the issue under consideration.

Themes

When the above process is complete, the student is in a position to examine the results for patterns or themes in relation to the issue under consideration in a structured way. At this stage the student orders their work through grouping and identifying central issues; making key issues central to the process; identifying aspects applicable to various categories and linking related themes, showing the extent to which they influence each other. The identified issues are organised into the order that they be discussed in the paper. Where a theme or issue is identified as influencing one or more other themes or issues, then it should be ordered in the structure of the paper so that it is addressed ahead of the themes it influences.

Fit

As academic papers are intended to address a specific area of interest, they need to show a position that the available evidence supports. Do the identified issues allow the question set to be addressed? Academic papers require an argument that addresses the hypothesis and articulates one of the four basic premises (either agreement with disagreement, agreement with qualification or disagreement with qualification) and the student should be able to identify this at this stage of the development of their paper (this does not mean that it will not change in the light of research but there should be clear indications that the evidence is leading to a particular conclusion). This is a valuable exercise for the student as the process gives focus to their work and direction for obtaining relevant supporting documentation.

Literature review

At this stage the student should be aware of the context in which their work is situated with the areas sufficiently established for them to proceed with investigation via recourse to the available literature. Students need to adhere to the following:

Researching

Higher education institutions, as a rule, stipulate from where students should obtain their supporting information for the construction of academic papers. Most coordinators of topics will provide a reference list of useful sources and students should be made aware of these.

Reviewing Articles and Papers

Heavy reading loads are intimidating, not only for non-Western International students. However, this load can be substantially reduced if the academic writing formula is understood. All good academic writing has an abstract or introduction that clearly outlines the argument/rationale and clear conclusions/findings/recommendations. Also each paragraph is usually structured as follows:

- Positioning Statement - Good academic arguments start with a positioning statement that outlines in general terms what is contained within the paragraph.
- Argument/Rationale - Written argument/rationale is a series of actual statements which supports particular points or positions. As a general rule, each paragraph should make only one point.
- Evidence - Academic evidence takes the form of reference to other academic authorities. Primary sources that have established the facts supporting the argument/rationale are the most appropriate.

Given the structure of academic papers, they can be easily summarised by reading the introduction, the first sentence of each paragraph and the conclusion. As an aid to students understanding of the content and for summarising academic papers, they should paraphrase the first sentence of each paragraph and write them down in order. If reading in this order does not make sense, then its usefulness as a coherent academic reference is questionable (see below).

Assessing the validity of sources

Reference sources that do not adhere to the above are unlikely to be useful to students. While there is a great deal of useful material available in this area, the students who are most in need of assistance are pressed for time and need simple, clear and prescriptive directions to adequately progress their academic writing (Valdes, 1994). As a general rule, the more recent a source is the greater its relevance, and primary sources are to be preferred over secondary sources. As most good academic papers are structured in the form of statement, argument / rationale and evidence, the student needs to be wary of using reference material that does not conform to this structure. Resources that do not have an opening statement to their paragraphs are difficult to read and understand. Those that do not have an argument /rationale can not be used in support of academic papers. Students should avoid those resources that have arguments without supporting evidence as these are of little use in support of academic writing.

In following the above steps the student will have gathered sufficient information to complete a detailed Background/Literature Review section of their paper that establishes the context to the issues under consideration.

Formulation of hypothesis

After completing the preceding steps, the student is ready to establish or develop a hypothesis for their paper. Academic writing is empirical and if the hypothesis is not clear from the set question then one should be derived so that it can be tested. The hypothesis is the position to be tested and supported in the paper. This is usually framed in terms of 'if then' statements. If something is changed then this will produce an effect that there is evidence for or, in the case of research reports, can be measured. At this point the argument/position of the paper should be clear – ie the issues that need to be addressed and how they can be addressed. The premise of the paper should also be clear ie the student a) supports a position, b) does not support a position, c) supports a position with qualifications or d) does not support a position with qualifications.

Testing findings

Before proceeding further the student should be able to answer the following:

- Does the developed argument hold - is the hypothesis / position supported?
- Does the information found address the question or issue?
- Does this solve the problem or address the issue of concern?
- Can the question set be answered?

If the student has doubts about these questions, then they should return to the literature review stage of the process and collect the relevant information. If after this process the problem can not be solved or the issue cannot be addressed then the student can state with some certainty that it can not be done with the tools/information currently available.

Evaluating findings

When students have a clear idea of the direction of their academic papers they should evaluate their position with a view to alternative explanations. The student should evaluate all of the information that has been gathered with attention to alternative explanations, delimitations, justification of the hypothesis (are there other hypotheses that can be answered by the data gathered) and any conclusions that can be drawn from this process (a clear or qualified answer to the issues under consideration). Any alternative reasons/explanation for what has been found should be outlined and discussed with the degree of their influence upon the hypothesis defined. This process will incorporate a balanced (objective) quality essential to academic writing. At this stage, if the paper's premise needs to be altered to better reflect the evidence it should be restated.

Stage 2: Producing the first draft

At this stage of the academic writing process, students should structure the main body of their work and clearly establish that they have addressed the problem/issue set for the paper. Specifically they should show that the paper adheres to the following:

Academic Context

Academic writing should be clearly written with each section supporting the next section; refer to everything of relevance; define the reasons for choosing to concentrate on some areas as more relevant than others (students should be able to articulate the reasons for deciding one theme is more important than another) and; clearly address the issue under consideration.

The academic argument

Do the areas/issues covered in the paper: relate to each other (are the linkages clearly defined); lead the reader to a conclusion from the information supplied in the paper; lead to the stated conclusion; and support the premise (is it clearly articulated).

Academic Structure

Academic writing follows a clear formula with a clearly defined body that sets the context, background/literature review of the issue/problem/question, shows the *who*, *when*, *what*, *what* and *why*, and is structured so that it can be easily read. It should have a clearly defined Introduction/Abstract that addresses:

- Who - for the issue/problem/question set are the authors of the current and past theories/research, and who are the subject of their theories.
- When - the context of the issue/problem presents
- What- happened when these issues/problems were present
- What- was it all about. Are there mediating factors that cause things to happen

- Why. Why the issue/problem was chosen to be addressed. Why some information/explanation is included and others excluded.

While these are important aspects of academic writing, the order in which they are addressed is not important (often academic papers will start by addressing *why* the research was conducted before addressing *who*, *when*, *what* and *what* – this will depend upon the type of paper/essay required).

Academic Format

Each paragraph should have an opening statement that outlines; in general terms; what it contains; an argument/opinion/reason that is linked to the issues that the paper addresses and; evidence that supports the argument/opinion outlined. For clarity the body of the text should have major and minor sub-headings that signpost the issues dealt with in that section.

Academic Style

Students should be familiar with the style of academic writing required in their course of study. This necessitates the student being familiar with the terminology used in the subject area where the paper will be assessed. Each major area of study uses specific language and terminology and these should be present in the paper. The style and language used should be apparent from topic publications and journals.

Academic Content

How well the content of academic writing is addressed, is dependent upon how well the issue written about incorporates and accounts for the debates/issues raised in lectures/seminars and set topic readings (these need to be accounted for in addressing the question). It is important that academic papers are situated in relation to the context of Lectures and Tutorials and adhere to length requirements. In a broader sense they must also be situated in relation to topic within the field of study.

Referencing.

Students are expected to acknowledge the ideas of others in academic writing and are expected to do so using a standard referencing method. Wherever a student uses information or ideas that have been attributed to someone else (an author, lecturer or presenter) then this must be acknowledged in such a way as to allow others reading the work to locate the original source of the material (Swales and Feak, 1994). This is often a problematic issue for Asia Pacific students as cultural protocols often preclude citing reference to a source with whom they have a personal relationship (ie lecturers) which can lead to issues of plagiarism. Students need to be aware that failure to properly reference the ideas of others can be treated as plagiarism with attendant serious consequences.

Conventions for referencing vary but students should be consistent in their use of one of the three main types of referencing, Author - Date, Footnote or Vancouver systems. In most cases the area of academic study will have conventions regarding this and students will be expected to use a particular referencing system. If the student is uncertain about this they should consult their academic coordinators/advisers or course handbooks for the conventional referencing systems of their area of study. While it may be confusing, it is not unusual for students studying in two or more areas to be expected to use more than one referencing system.

Stage 3: Checksum for academic writing

The following approach is for use by students who have completed an academic paper. The approach can be applied by the student and, if necessary, in conjunction with an academic adviser. It is a contextual writing tool for students to apply to their work that allows them to identify potential problems and ensure their work fits the academic template (Morgan & Kutieleh 2004). They should:

1. Consecutively write and number a short sentence that encompasses the content of each paragraph of written work.
2. Make that sentence the opening sentence for that paragraph (if the statement, argument/opinion/reason and evidence format outlined above has not been followed).
3. Copy each numbered sentence to the end of the written work.
4. Read the sentences in order – if the work follows a logical order (contains an argument) these sentences should make sense.
5. If the sentences do not make sense at this point then rearrange them so they follow a more logical order.
6. Write additional sentences to fill in the gaps in the argument, to give sense to what has been written- sub-number these and reorder the work accordingly. Fill in the blanks in the work (this may entail an additional literature review). Repeat steps 1-6. When this has been done and it makes sense what remains is a summary of the work.
7. Seek affirmation. Students should ask their lecturer/tutor or topic coordinator for feedback on the summary to ascertain whether or not the work addresses the central question, the argument is reasonable, or the work complete. Students should address any areas raised during this process and repeat steps 1-6.
8. Write a succinct Conclusion/Summary/Discussion. To do this students should paraphrase the result of the preceding steps (the first sentence of each paragraph) - writing in past tense. Some starting sentences may begin: “In this paper I have shown that (the hypothesis) is (the premise)...” or “This paper discusses the relationship between (issues) and (hypothesis) and concludes that (premise).
9. Write the Introduction/Abstract. To adequately signpost the issues and arguments in the paper, copy the conclusion to the start of the work. Take the conclusion and paraphrase it in future tense. Some starting sentences may begin: “This paper will explore current issues in (area of study) with a specific focus on (the main area covered) and show/argue that (the hypothesis) supports or does not support the (premise of the paper)”. When this process is complete the work is ready for final editing.

Concluding remarks

Non-Western students approach academic advisers for help with academic writing because they either have realised themselves or have been informed that they have a problem that needs addressing. And while there may be many resources available to address the deficiency, most of these are difficult to read for students who are less proficient in formal English. Therefore, adding to these students reading loads is not a recipe for success.

The processes outlined in this paper allow a systematic approach to be applied to work in progress that gives a clear indication of what steps are needed to complete a piece of written work. It provides a concrete set of instructions about what a student needs to do to resolve their academic writing issues. In unfamiliar surroundings, it is human nature to seek certainty and while these approaches may be prescriptive and formula driven, they offer students a concrete course of action that will resolve their issue. The outlined approaches offer a stepwise, staged approach that is beneficial for academic advisers. Its advantage, when used by student study skills advisers, is that it enhances documentation, making it easier for students to be referred to work with other advisers. It identifies the student’s progress in their paper’s development allowing them to be more easily serviced by alternative advisers. And it allows the student to be an active agent in identifying and developing their academic writing skills through a series of iterative steps.

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Laurenceson, J. and Duhs, D. University of Queensland, Australia. Teaching Quality and the Incentive Trail in Australian Higher Education

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ABSTRACT

One of the most prominent changes in Australian higher education over the past decade has been an increased reliance by universities on student sources of income. Contrary to the Commonwealth's rhetoric regarding the quality benefits associated with a 'user pays' system, numerous surveys and anecdotal reports during this period point to a decline in academic standards. In this context, a debate regarding the policies that should be adopted to improve teaching quality has never been more pertinent. This paper draws on the economics literature to provide a critique of the current policy regime. The economics literature offers a rigorous basis for designing policies to improve teaching, yet to date has largely been misunderstood or ignored by educationalists. In the higher education context, where academics and institutions are multi-output producers, economics points to the central role that incentive structures must play if improvements in teaching quality are to be widespread and sustainable. The paper then highlights the extant institutionalized incentive structures that relate to teaching from the Commonwealth level down (University, Faculty, School). Incentive mechanisms inconsistent with the goal of promoting teaching quality are identified and these represent the most obvious areas in which to focus policy efforts to improve teaching quality.

INTRODUCTION

Over the past two decades the higher education environment in Australia has changed dramatically, as it has in many other countries. One of the most striking changes has been increased university reliance upon income received from students as opposed to traditional sources such as Commonwealth Government grants. Between 1989 and 2002, income received from students rose from 5.9% to 37.9% of total university revenues (AVCC, 2003). This increase has been due both to a reduction in the government contribution to subsidized places for domestic students with the introduction of HECS in 1989 and its subsequent 40% average increase in 1997 (Chapman and Ryan, 2002), and to a dramatic increase in the number of full-fee paying students at Australian universities. Full-fee paying students (domestic and international) accounted for 27% of Australia's total university student population in 2002, up from 11% in 1994 (AVCC, 2003). This rise in the *average* share of student contributions in total university revenue still masks its importance as a *marginal* revenue source for universities. Between 1989 and 1996, the increase in student contributions made up 47% of the *increase* in total university income, compared with 31% from government sources and 22% from other sources. Between 1996 and 2002, these respective *incremental* figures were 57%, 18% and 25% (AVCC, 2003). Thus, the ability of universities to survive at the margin is now being increasingly determined by their ability to attract and retain students. The proposed 'Nelson reforms' aim to continue this trend with the cost to students of government-subsidised places in most major Australian universities set to rise by 25% in 2005 and with the loosening of restrictions on would-be domestic full fee-paying students.

The implications of this changed environment for teaching quality are complex in that opposing effects can be identified. Certainly, the implications are far more diverse than one would gather from the Commonwealth's rhetoric regarding the quality benefits of a deregulated higher education sector and the 'user pays' system. On the one hand, as has been stressed by the Commonwealth, survey evidence suggests that prospective students are keen to incorporate teaching quality considerations into their

decision-making, thus implying that more competition between universities could lead to an improved quality outcome. For example, James et al. (1999) reported results based on 937 survey responses and found that 44% of school-leavers and 49% of mature-age entrants stated that 'The quality of teaching in the course' had a strong or very strong influence on their choice of course, and hence their choice of institution. Teaching quality considerations also ranked highly relative to other factors such as advice from schoolteachers, parents and friends. Furthermore, it should also be noted that the direct pecuniary returns accruing to a School which attracts an additional student have been shown to be larger than those associated with other academic outputs, such as an additional research publication (see Stanford and Duhs, 1994). On the other hand, however, the possibility that greater competition for students amongst universities may result in teaching quality improvements needs to be tempered by the reality that potential students face sizeable information asymmetries when apprehending teaching quality. Although 44% of school-leavers stated that 'The quality of teaching in the course' had a strong or very strong influence on their choice of preferred course, only 25% said they had a reasonable knowledge or a good deal of knowledge regarding this factor and 49% stated they had little knowledge or very little knowledge. Accordingly, many students have tended to defer to the advice of 'experts' such as guidance counselors, or have looked to alternative signals of quality such as entrance requirements, which may or may not be correlated with actual teaching quality. It also needs to be acknowledged that in a bid to attract fee-paying students, instances have been reported in which universities appear to have compromised their academic standards through easing entry requirements, 'dumbing down' course content, adopting less rigorous assessment practices and even tolerating instances of plagiarism. Thus, in light of the information asymmetries, externalities, principal/agent problems and high monitoring costs that characterize the higher education sector, there is the distinct possibility that deregulation could actually worsen teaching quality outcomes.

Empirical measures of trends in teaching quality at Australian universities appear to vary depending upon whether the evaluation is based on student or staff assessment. Surveys of student perceptions of teaching quality such as the Good Teaching Score (GTS) from the annual Course Experience Questionnaire sent to all Australian university graduates show that for most fields of study there has been a steady improvement in Australian universities as a whole over the period 1998-2002 (Table 1).

Table 1: Good Teaching Score at Australian Universities: Broad Agreement that teaching standards are good in Economics and Other fields of study, 1998 – 2002

	Economics		Other Fields of Study	
	Broad Agreement	Broad Disagreement	Broad Agreement	Broad Disagreement
1998	34.5	28.8	37.5	26.1
1999	37.2	26.9	39.1	25.5
2000	36.3	28.0	39.6	25.3
2001	35.8	28.6	40.7	24.5
2002	38.8	24.7	42.3	21.8

Notes: – Broad agreement means agreed or strongly agreed on a five point Likert scale.

Source – DEST.

The GTS specific to Economics programs has consistently ranked below the average of other fields of study. The relatively poor teaching quality associated with Economics programs is not unique to Australia, with Becker and Watts (2001), for example, providing similar evidence in the U.S. context. Meanwhile, the staff perspective has tended to tell an opposite tale of declining standards. In a survey of

more than 2000 Australian academics from 12 institutions, Anderson, et al (2002) reported the widespread perception that academic standards had fallen in the past 10 years. A recent survey of 29 Heads of Economics Schools in Australian universities reported similar sentiments (ESA, 2004). The extent to which *declining* academic standards, such as including less challenging course content or less rigorous assessment standards, could actually have been rated by the average student as an *improvement* in teaching quality is an important topic, but an as yet unresearched one.

The layout of this paper is as follows. The next Section provides an overview of the literature regarding teaching quality. It offers a critique of the influential staff development position from the perspective of economics, and emphasizes the central role that incentive mechanisms must play at the level of the individual academic if improvements in teaching quality are to be widespread and sustainable. The next Section begins by noting that academics operate within a particular hierarchical institutional structure, and that the extant institutionalized incentive structures on offer from the Commonwealth down (Commonwealth to University; University to Faculty; Faculty to School) exert an impact on teaching quality. These incentive structures are then analyzed using the authors' own institutional context as a case study. The focus on the University of Queensland (UQ), the Faculty of Business, Economics and Law (BEL) and the School of Economics is purely for data collection convenience, and it is expected that many of the incentive structures identified will have counterparts in other contexts, particularly those in other Group of Eight (GO8) universities. Incentive structures that are plainly inconsistent with the goal of promoting teaching quality are identified and areas in immediate need of policy attention are thereby highlighted. A final Section summarises the findings.

POLICIES TO IMPROVE TEACHING QUALITY – AN ECONOMIC CRITIQUE

There are two broad views that seek to explain why the quality of university teaching is often found lacking. Staff developers hold that because academics are generally not formally trained educators, they lack the necessary knowledge base to transform their teaching practice into a professional, quality activity. Ramsden's text, *Learning to Teach in Higher Education*, is a representative example, which, according to the back cover of the recently released second edition, has now reached 'classic' status. This description is deserved in the sense that Ramsden's work is liberally cited by other educationalists and his text is commonly prescribed in staff development courses. Ramsden's thesis is that poor quality teaching in universities is due to academics not yet having adopted 'a transformed model' of teaching and learning. To acquire this transformed model, academics first must study their students' experiences of learning; to become familiar with, for example, the notion of surface versus deep learning and the strategies that can be employed to promote the latter. Secondly, academics must reflect on what their own conceptualization of teaching is and move from seeing teaching as a teacher-centred activity involving information transmission to a student-centred activity in which knowledge is socially constructed. The policy implication associated with this thesis is that to improve teaching quality academics need the assistance of staff developers. Conspicuously enough, staff development programs have featured prominently in attempts to improve teaching over the past few decades, and nearly all Australian universities now allocate considerable resources to educational development units, many of which have a history dating back to the 1970s. Some university faculties have taken this staff development agenda further and begun to make staff appointments conditional upon academic appointees completing a teaching qualification within a specified time period.

There are however alternative explanations of poor teaching quality that point to a different root cause and imply a different policy response. Building on Adam Smith's writings in the 18th century, economists (e.g. Becker 1975) have argued that one only needs to look at the relative incentives facing academics to realize why teaching quality is sub-optimal. Economic models of teaching quality begin with the basic resource allocation problem facing academics, namely that they must produce *multiple outputs*, such as teaching and research, with *limited* resources, in particular their time. The essential conclusion of these

models is that if research is relatively better rewarded (through tenure, promotions, direct pecuniary returns, etc) then it is to be expected that academics will allocate time *at the margin* to producing research. In consequence, the quality of teaching will suffer. The policy implication forthcoming from economic models is that improved teaching quality requires accurate monitoring mechanisms and a shift in the *relative* incentive structure towards teaching (Becker 1979). In contrast to the proliferation of staff development programs, the incentive structure faced by academics has changed little over time, and survey evidence covering the 1970 - 2000 period across a range of academic departments shows the widespread perception among academics that the reward structure in Australian universities has steadfastly been biased away from teaching towards research (see amongst others Duhs & Duhs 1994a; and Ramsden et al. 1995).

Staff developers, however, have emphatically dismissed the economic proposition that there is a link between the incentive structure and teaching quality. For Ramsden (1992), this notion is based on a 'Naïve understanding of improving teaching'. He states-

'The conviction that there is a link between poor teaching and lack of incentive to perform seems to be an area of common ground between staff associations, employers and educational development lobby organisations.

Sadly, much slack thinking characterises this debate. The argument that there should be tangible rewards for excellence in teaching, is easily mixed up with the very different argument that good teaching in higher education should be recognised and that support for improving teaching should be visible. It is sometimes also confused with the idea that there are too many rewards for research and scholarship, and not enough for teaching. It is asserted that the relative priorities of the system are unbalanced, and that lecturers will continue to be bad teachers as long as they get most of their benefits (prestige and promotion) from research, while only lip service continues to be paid to teaching.

But what are the facts about incentives in higher education? The idea that material rewards will in themselves improve teaching does not stand up to much scrutiny. Promotions, salary increase, and prizes for teaching may have some symbolic value...but their direct effect on good teaching is negligible...The search for higher quality education would be so much simpler if the academic beast responded positively to sticks and carrots'. (p.251)

Ramsden's reason for supposing that academics do not respond to incentives is that 'Studies of academic motivation indicate that most of our desire to do well, as researchers and teachers, comes from within' (p251). The view that intrinsic incentives may sometimes be crowded out by extrinsic incentives is associated with Bruno Frey (1997), but no empirical evidence to this effect has ever been presented in the academic context.

Such rejection of economic theory by staff developers is in spite of their own survey evidence showing that academics rate issues of resource allocation and incentives - the province of economics - more highly than staff development activities as determinants of teaching quality (see survey in Ramsden, et al, 1995). Staff developers attempt to resolve this conflict by interpreting their survey findings to mean that academics are saying that resources and rewards are important in the sense that they show that their institutions recognize and support moves toward good teaching. That is, rewards do not impact on teaching quality by affecting the willingness of academics to allocate time at the margin to teaching but rather contribute to creating an environment conducive to staff development activities in which academics

- driven by their intrinsic motivations - 'can perform to their maximum ability, while at the same time trying to change their understanding of what teaching means' (p.253).

The problem with the staff development position is that it lacks the 'basis in evidence' its proponents ascribe to it (Ramsden, 2003, p.8). As evidence to support the key underlying premise of staff developers that academics do not respond to rewards in their resource allocation decisions, Ramsden (1992) cites two studies –

'McKeachie (1982) and Miller (1988) found no evidence that merit pay and other awards for teaching effectiveness enhanced quality and productivity in US higher education' (p.252).

These two studies are unpersuasive, however. They do not tell us how large the incentives on offer were for quality teaching, or how large they were relative to the rewards on offer for research. Rigorous evidence that intrinsic motivation to perform to a high standard is significantly greater for academics than for those in other professions has yet to be provided. Moreover, even evidence that there are academics who are intrinsically motivated and / or who have a strong commitment to teaching relative to research does not reduce the relevance of incentives for achieving widespread and sustainable improvements in teaching quality. Staff developers miss the basic point of economic theory that even if academics on average are intrinsically motivated to an unusual extent to perform well in both teaching and research, this does not resolve their basic resource allocation problem. Choices must still be made as to how to apportion their time. If *improving* the quality of teaching is the goal, it is the *marginal* academic and the *marginal* hour that matters.

Staff developers also appear unaware of a sizeable body of empirical evidence in the economics literature that discusses the impact of incentive structures on academic time allocation. In the U.S context, Singell et al (1996) analysed questionnaires administered to 8000 instructional faculty at 480 institutions, and concluded that –

'We find that most significant differences in faculty time allocations between institutions are due to incentive differences that, for teaching and research time, are reinforced by differences in faculty attributes. Thus, our results suggest that an institution can redefine its mission toward teaching by changing its incentive structure; however, the time allocation response of faculty is likely to be tempered by the faculty member's acquired attributes that reinforce the extent of the institution's mission under which they were hired or have been working' (p.448)

Similarly, a more recent U.S study reported the response of around 3000 academics to changes in the perceived relative incentive structure between 1995 and 2000. Harter, et al. (2004) reports –

'In the aggregate, time spent teaching increased from about 52 to 56 percent, whereas the time devoted to research fell from about 30 to 23 percent. The perceived weightings for research in promotion and tenure decisions fell from about 44 to 38 percent and for annual raises from about 40 to 37 percent. Therefore, although already allocating a disproportionate amount to time to teaching in 1995 (compared with the incentive structures they were facing), the perceived increase in rewards for teaching and decrease in rewards for research were associated with even more time devoted to teaching and less time to research in 2000' (p.91).

Similar evidence is available in the Australian context. A survey by Duhs and Duhs (1994a) of over 1000 academics found that some 70 percent endorsed the view that rewards for teaching were insufficient to justify significantly *increased* teaching effort (see Duhs and Duhs, 1994b for a more complete review of the earlier Australian survey evidence on this topic). A more recent survey by Guest and Duhs (2002) again found evidence that academics were sensitive to rewards, particularly those associated with tenure

and promotion, in allocating their discretionary time amongst producing teaching, research and other outputs. Fox and Milbourne (1999) present evidence that suggests the size of the tradeoff could be substantial. Their survey of 150 academic economists in Australia, which was designed to identify the factors that determine research output, reported that a 10 percent increase in the number of teaching hours is associated with a reduction in research output of 20 percent. In summary, academics do not necessarily lack the knowledge or technique to improve their teaching performance, or the ability to acquire it; but they do lack the reason to do so. In the Australian context an implication of Singell's finding is that it may be expected that academics in research intensive universities may be less responsive to changes in incentives than those in universities that traditionally have had a lesser focus on research.

Economists do not dispute that staff development activities have a role to play in improving teaching quality by raising awareness of pedagogical issues amongst academics. What they emphasise is that before teachers concern themselves with how they can improve their teaching, and their understanding of its impact, more serious attention needs to be given to what determines their desire to confront and develop that understanding. Likewise, more serious attention needs to be given to the determinants of academic willingness to apply previously acquired pedagogical knowledge as an ongoing part of their teaching practice. The economic model thus suggests that policies associated with the staff development position, such as allocating more funds to educational development institutes or requiring that academics attain a formal teaching qualification, are in themselves unlikely to effect widespread and sustainable improvements in teaching quality. Whereas staff developers concur with the predictions of economic theory (even if unwittingly) that the approach a student takes to learning (shallow versus deep) can be strongly influenced by the incentives they face (such as assessment), it is time to base policy on the fact that if academics are to adopt a deep approach to learning about their teaching, the relative incentive structure they face must first change.

To economists, it is thus the Ramsden position which represents a 'naïve understanding of improving teaching', and which stands not only devoid of any empirical evidence but also in defiance of the empirical evidence which is in fact available in the economics literature. Outside economics, the clinical psychologist Robert Lindsey also questions the quality of evidence cited by staff developers. In reviewing the second edition of Ramsden's text, Lindsey concludes that 'for the most part it seems to be the type of evidence associated with the preacher in the pulpit, or the salesman on the doorstep, rather than the securely grounded research evidence that would make an appropriate foundation for a practitioner-orientated discipline such as ED [education development]' (p285).

Because measuring teaching quality is problematic there is nonetheless sometimes a fear that a policy approach designed to improve teaching by changing the incentive structure may worsen teaching quality, rather than improve it. For example, if teaching rewards are tied solely to student evaluations of teaching, the result may be that teachers will strive to be popular, perhaps through 'dumbing down' course content or adopting less rigorous assessment procedures. Likewise, if teacher rewards are linked to students' performance on assessment, the result could be 'teaching to test' to the exclusion of ultimately more important ends. Nonetheless, while it is true that all measures of teaching performance are less than perfect, the fact remains that if all such measures are deemed to be so imperfect as to be (equally) unusable a *perverse* incentive structure is simply guaranteed, given that research performance is itself being measured (Milgrom and Roberts, 1992). Thus, the appropriate policy is not to abandon the use of incentives but rather to find the most accurate measures of output that are available, in order to avoid the wholly undesirable result of leaving teaching quality aside in incentive structures (or merely encouraging it through exhortatory methods) while research is more clearly rewarded through career and income means.

THE EXTANT INCENTIVE TRAIL IN AUSTRALIAN HIGHER EDUCATION

It is important to recognize that each academic operates within an hierarchical institutional environment; that is, within a School, Faculty and University. While these institutions are enjoined to produce high quality results in terms of both teaching and research, they must also exist as financial units, and respond to budgetary pressures. While the incentive structure faced by individual academics has been relatively well documented, too little attention has been given to the institutionalized incentive mechanisms that exist in the funding arrangements by which Universities, Faculties and Schools derive their income and which impact upon the quantity and quality of their teaching and other activities. These institutionalised funding mechanisms are not always well tailored to producing the results aspired to in University, Faculty, School or individual mission statements, and may indeed sometimes be *perverse*. For example, in a research context, the Vice-Chancellor of the University of Melbourne (9/1/04) objected that University of Melbourne received no increase in its share of Commonwealth Research Training Scheme (RTS) funding despite increasing its indices in all relevant areas, while some other universities performed worse but received more. VC Gilbert says Melbourne was shortchanged \$6 million compared to what it would have got for 2004 if the RTS index had been used. Likewise, the heavily publicised University of Newcastle plagiarism case involving fee paying students from Malaysia (still before the NSW Independent Commission Against Corruption, November 2004), also gives rise to questions about extant incentive mechanisms within Universities (*The Australian* 13/08/2003). Some would ask what else can be expected when federal funding is suddenly cut. Yet another form of perverse incentive at least potentially exists when certain University Schools allow academic appraisal solely on the basis of progressive assessment. Given that authorship cannot be authenticated in such cases, that it is known that paid markets exist for the writing of essays, and that downloading from internet sources is relatively easy, it is apparent that there is potential merely to buy an academic result. This is an even bigger issue when permanent residence and citizenship rights are themselves influenced by academic success at an Australian university. Both the opportunity and the incentive for such cheating exist.

At the very least it is apparent that matters of university teaching quality should not be discussed in isolation from awareness of the incentives present in such arrangements. Incentive mechanisms within Universities, Faculties and Schools plainly warrant scrutiny, to assess their compatibility with the declared goal of improving teaching quality. What follows is an attempt to analyse some such incentive structures by using the authors' own institutional context as a case study.

From Commonwealth Government to University

The university funding approach used by the Commonwealth has changed over time, moving away from a single block funding amount for all teaching and research activities towards the distribution of separate component sums, themselves to be redistributed annually according to changes in performance on published indexes. UQ's grant for 2004 is made up of separate components for:

- research (IGS: Institutional Grants Scheme),
- research training (RTS: Research Training Scheme), and
- teaching.

The IGS and RTS components are allocated competitively based on the measured outputs of (a) research grants (b) research degree completions (c) research degree student load and (d) research publications. These performance indicator components are currently weighted at 35:30:25:10 (which is a variation on an earlier 40:40:20 rule for publications; post-graduate (P/G) student strength; and research grants). Over time the relative importance of grant income has increased, which is no surprise, given the decline in direct university funding from Government.

Commonwealth funding for general operating purposes, primarily under-graduate (U/G) teaching, is extended as a single block grant. In contrast to research funding, this grant is not based on any output quality measures but rather is 'historically based' and tied to a set student load target. The only

conditionality attached to these funds is that universities participate in certain 'quality assurance' activities. For example, each Australian university is currently going through an audit process conducted by the Australian University Quality Agency (AUQA). The reports produced by the AUQA however are not used to rank universities or determine their funding and the focus is almost exclusively on processes in place rather than the actual outputs produced. The proposed Nelson reforms provide for the establishment of a Teaching and Learning Performance Fund (TLPF) with details of how these funds will be allocated yet to be finalised. What is clear is that the share of funds linked to teaching *quality* will remain miniscule. For example, in 2003, total Commonwealth funding for general operating purposes of universities totaled \$4952 million. The resources available through the proposed TLPF will be \$54.7 million in 2006 and \$83.8 million in 2007 (DEST 2003; 2004).

Therefore, at the Commonwealth to University level, there are no explicit incentives on offer that act to promote quality teaching. It is important to note that research outputs are being measured and rewarded, so that the relative incentive structure at this level is actually biased *against* teaching. It is apparent that the problem with regard to the quality of university teaching starts at the top.

From the University to the Faculty

UQ (21/11/03) notes that its operating budget allocates specific amounts from the Commonwealth Operating Grant and from other general funds for university wide allocations (including centrally funded overheads), and then allocates the balance among major operating areas with the faculties receiving 70% of the balance. Specific income, including tuition fees, is distributed separately from general funds allocations. Tuition fees are distributed on a formula basis, with the Faculties receiving 70% of net fees, excluding capital component, for all categories of fee paying students.

In distributing the faculties' general funds allocation, some specific off-the-top amounts are deducted (eg to support the University's Teaching and Educational Development Institute) and the remaining funds are distributed among the seven Faculties and the Institute of Molecular Biology (IMB). In its formula for allocating general funds to its Faculties, UQ chooses to use the same parameters as are used by the Commonwealth in distributing grant funds to the university, but nonetheless chooses to vary the weights in an effort to better reflect local factors. The formula used for intra-UQ purposes is thus a variation on the 35:30:25:10 formula used by the Commonwealth and includes (UQ 21/11/03) –

(nnn)	a research and research training component (representing 50% of anticipated RTS allocation plus the full net amount of IGS expected allocation), and
(ooo)	a coursework undergraduate (U/G) teaching load component, which represents the balance of the amount available by allocation by formula. Base student load is measured in Equivalent Full Time Student Units (EFTSU) and is restricted by Commonwealth criteria to categories eligible for funding support from the Operating Grant (ie fee paying students and non-students are excluded). Tuition fees support most P/G coursework places and only a small amount of P/G coursework load is supported by the Operating Grant.

What is clear is that any resource allocation mechanism which gives high weight to research income and low weight to publications – which is what is involved in the current Commonwealth and UQ formula – acts to the relative disadvantage of 'low cost' faculties such as BEL. This has implications for the resources available to BEL for producing academic outputs, including good teaching.

The remaining U/G Operating Grant Load figure for the respective Faculties is weighted by a Faculty Funding Index to reflect perceived cost delivery differences between the Faculties. The Faculty Funding Index in use at UQ assigns BEL Faculty the lowest Index value of 0.623, as against 0.786 for Arts, and 1.407 for Natural Resources, Agriculture and Veterinary Sciences. No source or justification is given for

these Index values and yet, as is the case with the research funding distribution formula, they have clear implications for the resources that faculties have to promote good teaching. Although ostensibly a reflection of relative teaching costs it seems apparent that this Funding Index is a form of tax on BEL Faculty for being well placed to earn overseas fee income from business students. Having less need, BEL receives less from general UQ allocations.

For BEL, the incentives on offer to promote good teaching fall well short of the ideal.

From the Faculty to the School

In 2003, \$13,093,137 in Commonwealth funding was distributed to BEL Faculty. Table 2 shows that the student load component of Commonwealth funding was 88% of the total, while research

Table 2a: Teaching and Research Income for BEL Faculty 2004: Commonwealth Funding (Final)

Research Component	\$1,509,624	12%
Student load Component	\$11,171,687	88%
*Total Allocated	\$12,681,311	
Teaching Allocation		
Student load Component	\$11,171,687	
Less 5% Teaching Performance	\$558,584	
Teaching Allocation to Schools	\$10,613,103	

Table 2b: Allocation to Schools

Schools	Research (\$)	Teaching Component (\$)	Teaching Performance (\$)	Total 2004 (\$)	Total 2003 (\$)	Variation (\$)
Business	653,854	4,597,391	241,963	5,493,208	5,773,390	-280,182
Economics	484,186	2,270,227	119,863	2,874,276	2,997,948	-123,672
Law	251,592	3,680,835	193,346	4,125,773	4,152,013	-26,240
TALM	119,991	64,650	3,412	188,053	169,786	18,267
Totals	1,509,624	10,613,103	558,584	12,681,311	13,093,137	-411,826

allocation accounted for only 12% of the total. It is apparent that Schools are paid to teach, albeit they are exhorted to research. A 'levy' of 5% of the student load component was allocated on the basis of 'teaching performance'. While earmarking funds for such purpose may appear to act as an incentive for Schools to promote teaching quality, all four Schools within the faculty received *exactly the same percentage* of these funds as they received from the basic teaching load component. This is so despite evidence of variations in teaching and course quality between the Schools (see TEDI, 2004). Thus, it may be concluded that funds supposedly tied to teaching performance have in fact been distributed on the basis of administrative processes in place rather than the quality of teaching produced.

In 2003 the BEL Faculty received \$1,466,952 in Commonwealth research funding (Table 3) and allocated it between Schools in proportion to performance in respect of the four research parameters used by the University to allocate funds to Faculties. Note that the intra-Faculty formula implied by the allocation of funds between Schools is not the same as is used by the University to allocate funds to the Faculties (which is the one used by the Commonwealth to allocate funds to the University) (Table 4). The intra-Faculty distribution formula also appears to change from year to year.

Table 3: BEL Faculty Allocations: 2003 Research Component Funding \$

School	HDR* Awards	Publications	Research Grants	HDR Load	Total for 2003
Business	245,963	181,322	65,387	178,824	671,496
Economics	158,939	153,591	59,103	85,827	457,460
Law	40,994	87,228	7,907	100,060	236,189
TALM	46,850	32,056	0	22,901	101,807
Total	492,745	454,198	132,397	387,612	1,466,952

Source - University of Queensland, BEL Faculty. * HDR = Higher Degree Research.

In 2004 Economics received 21.4% of the teaching allocation to Schools within the Faculty along with 32% of the research component of Commonwealth funding to the Faculty. Total 2004 Commonwealth funding allocated to Economics School was down \$123,672 relative to 2003, essentially because of a fall in teaching income.

Table 4: Intra-Faculty versus Inter-Faculty Research Fund Allocation 2003

	Intra-faculty Allocation (\$)	BEL <i>Implied</i> Formula to Schools (%)	UQ Formula to Faculties (%)
HDR awards	492,745	33.6	30
Publications	454,198	30.9	10
Research Grants	132,397	9.0	35
HDR Load	387,612	26.4	25
BEL Faculty Total	1,466,952	100	100

Source: University of Queensland, BEL Faculty.

Several points are noteworthy:

- ◆ this intra-BEL allocation formula represents quite a departure from the UQ formula for allocation to Faculties (ie the 35:30:25:10 rule). The nature of this departure is such as to hurt Schools with disproportionately high research grant income and help those with high publication rates.
- ◆ In each case these four component amounts are then distributed to the four Schools within BEL Faculty on a percentage basis.
- ◆ *Incremental* values consequent upon these research component allocations (reflecting 2000/2001 data – derived from Table 4: See Stanford and Duhs, 1994) are:
 - HDR Awards: one extra Award to Economics School \$7,757
 - Publications: one extra publication for Economics School \$1,472
 - Research Grants: an additional \$50,000 grant to Economics \$2,647
 - HDR Load: one additional higher degree research student unit \$3,323

Note that the payoff per publication is small, compared to payoffs for incremental output performance in the other three categories. As far as the School is concerned, it pays to get additional post-graduate students and additional research grants. Note also that U/G teaching funding of \$10,944,546 was provided to BEL Faculty by the Commonwealth for 2003, together with P/G funding of \$100,330. This translates

to an average value per EFTSU in 2003 of \$3,206.89, with an implied incremental value to Economics School of \$2,077. This is about 1.4 times the value of an extra publication. For reasons that remain unclear, Commonwealth-funded Economics EFTSUs are weighted by a factor of 1.1 at UQ, while Law EFTSUs are weighted by a factor of 1.15. P/G funding is low since few P/G EFTSUs in 2002 were Commonwealth funded. From these teaching funds an incremental value of \$4,706 attaches to an extra P/G EFTSU for Economics, while average P/G funding runs at \$5,227. .

- In each of the four research component cases, each School within the Faculty is competing for a share of a fixed pot of funds. If each School doubled its performance in all four categories, there would therefore be no change in dollar allocations. Relative position determines absolute income.
- Given the changability of intra-Faculty funding allocation rules, efforts to increase a School's relative position in any one of the four research categories is a questionable tactic. The intra-Faculty rule does not replicate the inter-Faculty rule and the reason for allocating only 9% of Commonwealth funding on a research grant basis remains unclear. One possible interpretation is that intra-Faculty numbers are 'jiggled' until the consequent allocations have political appeal. If so, the answers come first, and an allocative principle to underpin that allocation comes later.
- For the Economics School the overall consequence of these allocations is that Economics gets \$457,460 of Commonwealth research funding or 31% of the Faculty total, which is less than its share of the research grant income that the Commonwealth's criteria imply to be more important.
- The real issue is how to win the administrative argument as to which rules will apply in allocating the total Faculty research component between the four constituent parts. A lack of certainty as to what these rules will be inhibits any systematic School response to these incentive mechanisms.

The incentive mechanisms operating at the School level can be summarized by observing that while about 83% of Commonwealth funding coming in to the School relates to U/G teaching, there are no particular institutionalised incentives on offer to increase teaching quality.

CONCLUSIONS

Student contributions provide an increasingly dominant share of *marginal* revenue sources for Universities. Incremental values in terms of the contribution to School income show that the contribution of one more EFTSU or of one more fee paying student remains high, relative both to underlying marginal costs and to the contribution of research outputs such as one more research publication. To that extent it remains the case that Schools are funded to teach while exhorted to research. At the same time, individual academics perceive themselves to be paid to research whilst exhorted to teach well. Extant incremental values imply that considerable pressure will exist to attract students, especially if they are full fee paying, but counterpart pressures to maintain academic standards and improve practical teaching quality are not always as apparent. *In respect of the latter goal of improving teaching quality the costs are higher both for Schools and individuals, and the financial benefits – again both for Schools and individuals - are less well defined.*

Given that higher education markets are characterised by significant externalities, information asymmetries and high monitoring costs, there are obvious problems in maintaining teaching standards in the face of Minister Nelson's vision (post 2004 federal election) that universities need to find more funding and be less regulated. This is exemplified by the present much publicised Newcastle plagiarism case and by the fact that some universities allow 100% assessment by progressive assessment in a context in which it is known that there are markets for buying essays. This is a market that should not exist, but which does exist, in the welfare economics theory which underpins the Nelson reliance on competition as a route to efficiency in the higher education market.

Teaching quality will never be easy to measure definitively. However, non-measurement simply guarantees an aberration in the relative incentive trail. Given the conflicting results reported in surveys of

staff as against students, further research is needed on the extent to which student apprehension of improved tertiary teaching standards is a reflection of enhanced quality or of reduced academic cost. There is clearly a cleavage between the way in which staff developers and economists go about apprehending the causes of teaching quality and the policy responses most likely to improve that quality. From the perspective of economics it is apparent that present institutionalised incentive structures are sub-optimal. Much of the incentive trail, from the level of the Commonwealth down to the individual academic, presently operates *to distort* the behaviour required for a determined effort to improve academic teaching standards. As a result, if teaching quality is perceived also to be sub-optimal we should be unsurprised. If we are to move beyond mere rhetoric and seriously set about improving the quality of university teaching, the necessary policy focus is clear.

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Lorensten, A. Aalborg University, Denmark. National, European and Global Collaborative Efforts to Further the Introduction of ICT into Universities

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ABSTRACT

All universities are challenged with the introduction of ICT to improve the quality of teaching and learning. Many universities try to overcome the very complex problems of ICT implementation on their own, with substantial costs and often without the expected success. Therefore ICT implementation should rather be regarded a field for collaboration among universities.

This paper will describe, analyse and discuss different models and experience of university collaboration in the field of new teaching and learning technologies in Higher Education. Cases studied are a permanent Danish national initiative comprising all Danish universities, called 'Continuing Education at Danish Universities – A Virtual Approach', a running European eCompetence Initiative with 20 participating universities under the leadership of the German University in Dortmund and finally the global work of the Technology Commission of the 'International Association of University Presidents' (IAUP).

Issues to be dealt with in the paper are on the one hand an analysis of the problems we are faced with when introducing ICT into universities, on the other hand – on the basis of the studied cases – an evaluation of how such problems may be solved (better) in a collaboration among universities in a national or an international context.

INTRODUCTION

The role of universities is changing. Whereas universities used to be institutions only for the elite and institutions taking care of academic matters rather isolated from the rest of society, modern universities need to engage much more actively in what is going on outside universities. All the traditional universities need to a much higher degree than before to reach out to society and to interact with the needs of society, something which is already on the agenda in most open universities (Schutte and van der Sijde 2000, Guri-Rosenblit 1999). There are many reasons for this change. One is financial, another political in a broader sense.

The developed countries in the world are going through a change process from having mainly industrial cultures to becoming knowledge economies. Knowledge economies are dependent on production of new knowledge and on the integration of this knowledge into actual products. To succeed in that a much better educated and higher skilled workforce than in the era of industrialized mass production is a must. Therefore a much higher proportion of young people need to go to university than earlier and a much bigger proportion of people already working needs to update their knowledge and skills at university level on a lifelong basis. Universities have to recognize this to survive. Broadening the intake of students means, however, that finances at universities become scarce, since governments are not willing or able to give universities more money to finance the growing number of students. Therefore universities are faced with both a political and a financial incentive to interact much closer and continuously with the surrounding society. Universities simply have to interact with business and industry to negotiate what

competences are needed and therefore to be produced at universities in a knowledge economy and to raise money through collaborative projects with external partners.

Information and communication technology (ICT) is and will be an important part of this paradigm shift from universities as ivory towers to entrepreneurial universities. ICT related competencies such as the ability to find, use and present information on the internet, to collaborate in a virtual setting and across borders using the internet, to communicate in virtual settings are important parts of the portfolio of competencies needed in knowledge economies. Therefore university students have to acquire such ICT related information competencies and collaborative and communicative competencies as parts of their university degrees.

Another key competence of the workforce in a knowledge economy will be the ability to update one's own knowledge and skills on a continuous basis using appropriate methods and means for this. To support students' acquisition of this lifelong learning competence, universities need to change their teaching methods and put much more stress on active, self-initiated, self-directed learning from the learner, on more collaborative learning and on the use of internet, learning portfolios, databases, eLearning etc. as important means for future learning (Knapper and Dropley 2000).

ICT related competence building and use of ICT in university teaching and learning must therefore become part of all universities' curricula and methods.

Besides being an obligatory part of modern university curricula and modern university teaching and learning, use of ICT will also become an important means of surviving as an entrepreneurial university in a broader sense. Web based information from universities may create the amount of transparency which is the key to successful collaboration between former secluded universities and business and industry.

In this paper focus will be on the growing role of ICT in teaching and learning at universities and the problems and challenges this may cause.

PROBLEMS RELATED TO IMPLEMENTATION OF ICT IN HIGHER EDUCATION

Both theory and experience show that the introduction of ICT into university teaching and learning cause many problems and challenges (Dirckinck-Holmfeld and Lorentsen 2000 and 2003, Lorentsen 2002). This may be explained by referring to university culture, university management, and universities as organizations as such (Bates 2000).

In this paper we will concentrate on four major problems which will be described, analysed and discussed further in the three following case studies, where different combinations of universities in different settings have tried in collaborative efforts to meet such problems.

On an individual level two major problems appear when universities try to shift from traditional teaching methods to use of ICT and when they try to integrate ICT related competence building of students into their curricula. First and foremost university professors and teachers in most cases do not have enough knowledge of and skills in ICT to be able to use ICT themselves for teaching and learning, not to mention to serve as inspiration and good examples for future students in relation to use of ICT and to the acquisition of relevant ICT related competencies needed in working life. So a major problem and challenge for universities will be to make teaching staff e-competent (Edwards, Baume and Webb 2003, Hoban 2002).

Making university teaching staff e-competent is, however, not just a matter of creating and delivering good staff competence development programs. University culture simply does not support such an effort.

University professors earn respect and get credit mainly for their research. New initiatives related to teaching therefore always face problems, but as proper use of ICT by university teaching staff mostly presupposes a considerable amount of updating and ICT related competence development the innate lack of incentives in universities for the individual professor/teacher to develop his teaching methods becomes extra crucial. Lack of incentives for the extra effort related to taking up ICT by the individual professor/teacher must therefore be termed a second major problem when implementing ICT in universities (Bates 2000).

The need for creation of incentives for professors/teachers to join in e-competence development measures leads us from problems on an individual level to organizational problems when trying to introduce ICT into universities. A very big problem here is that traditional university culture contradicts what is needed for successful ICT implementation in organizations such as universities, wherefore ICT implementation becomes not only a matter of technological change, but also a matter of organizational change and change of teaching and learning philosophy (Collis and Moonen 2001, Hargreaves 2003, Jain 1999, Peters 1998). Traditional university culture is characterized by strong individualism and rather weak management. Individual professors are responsible for developing and delivering quality products and activities in their own area. Parallel and decentrally, even individually organized activities combined with an often not very visible central management therefore traditionally characterize academic matters. In opposition to this the implementation of ICT in big organizations like universities call for both coherent and considerable common organizational measures and a strong management, since so many resources are involved (Bates 2000, CRE DOC 1996 and 2000, CRE Guide 1998). Therefore ICT implementation in universities is not just a question of buying in technology but involves going through organizational changes, where individuals – in this case individual professors – may feel their independence is being threatened. A major challenge related to ICT implementation in universities will therefore be to balance the strengths of traditional university culture, e.g. strong very independent, responsible individuals on one hand and on the other hand taking care of the total university as a coherent organization through more visible management. This balance is often obtained through appropriate combinations of bottom up and top down initiatives. In all cases a shift in management culture is necessary.

E-competence development and change of university culture and university management, which have been mentioned as the three main problems related to the introduction of ICT into universities, are in fact so huge challenges to most universities that only few of them would succeed on their own. Instead a fourth challenge may be formulated, comprising the three others, e.g. how to engage in collaboration with other universities to meet the challenges of e-competence development and cultural and management changes caused by the implementation of ICT.

To conclude, four problems or challenges related to the introduction of ICT into universities have here been discussed. University teaching staff needs to become e-competent. University culture has to undergo some changes, so that incentives are created for the individual to become e-competent and to see themselves as parts of an ICT-supported and ICT-integrated totality instead of looking at themselves as individuals only. Also universities as organizations have to change to be able to make management interests when introducing ICT more visible and to combine these interests with the interests of individual professors and decentralized units. Finally universities need to collaborate more to succeed in implementing ICT and meeting the challenges this causes to most universities.

MODELS AND EXPERIENCE OF UNIVERSITY COLLABORATION IN THE FIELD OF ICT

When trying to solve the above mentioned problems and challenges related to the implementation of ICT, universities may initiate different activities in different settings, and so they do. Experience shows, however, that many universities do not consciously enough describe, analyse and choose between different possible, but not all equally successful, solutions to their ICT implementation problems. In order

to support a more conscious and explicit choice between possible ICT implementation methods in universities different models of solving implementation problems and related experience will be described, analysed and discussed in the following.

Three case studies have been chosen which cover different target groups in universities and different settings. The strengths and weaknesses of each case will be analysed and discussed. In doing so it will become clear that each of the three models helps solve specific parts of the mentioned problems and challenges above and neglects others. To solve all mentioned ICT implementation problems they must therefore be combined. All of them are based on collaboration among universities, however, since this seems to be a must according to the fourth challenge mentioned above.

A National Collaborative Initiative – The Danish Virtual University

The first case to be studied here is the Danish virtual university which started up in 2003. The Danish virtual university is not a separate institution. Instead it may be characterized as a collaborative network among all twelve existing Danish traditional universities. In its first phase activities concentrate on continuing education programs of all universities. On the internet the Danish virtual university takes on the shape of an internet portal, comprising two different main activities. Firstly www.unev.dk, the name of the internet portal, contains a course marketing section, where information on all offered programs from all twelve universities may be found and compared, experience of former students may be read, and competence development needs in business and industry which are not already being met through existing courses may be described and sent to the editorial board of the portal, placed at Aalborg University's Department of Education and Learning, hopefully ending up in the creation of new appropriate courses by one or more universities to meet the needs of the users of the portal. Secondly the Danish virtual university contains a section for development of teaching and learning methods at all universities in order to be support the use of the newest and most appropriate delivery methods in all courses offered through the portal. So in more detail the objective of the development section of the portal is to support the introduction of virtual teaching and learning at all Danish universities, beginning with vocational education programs, but not limited to such programs. In this context of discussing different models for handling ICT implementation problems in universities focus will be on the second section of the Danish virtual university, the development section.

The target group of the development section of the Danish virtual university is individual university professors or individual employees in university staff development units. The portal offers these individuals inspiration through updated information on virtual teaching and learning. Firstly a newly opened electronic journal, where university professors and university staff from all twelve universities describe, analyse and evaluate different theories, models and experience concerning virtual learning environments and the role of virtual teachers, serves this purpose. Secondly seminars and workshops are run in shifting Danish universities, open to everybody at the twelve collaborating universities. To secure the relevance and quality of the offered information two measures have been taken. A first quality assurance measure is that a group of experts with participants from most of the collaborating universities has been formed. This group has two tasks: to secure that the information and the activities of the portal relate as closely as possible to the internal activities at each of the twelve collaborating universities, and to guarantee the quality of the information offered through the portal. The expert group defines the themes which are introduced and analysed through the information and the activities of the portal, and the expert group edits the electronic journal published in the portal. A second quality assurance measure taken is that the editorial board of the portal on a continuous basis carries through studies of the needs, wishes and expectations of adults and of business and industry as to how they want continuing education programs to be run (both content wise and as to what delivery methods they prefer). So in 2003 a major survey based on an electronic questionnaire about relevant delivery methods for adults has been carried through with over 3700 informants (Lorentsen 2003), and 2004 a major qualitative study based in interviews with about

60 adults will be published, focusing on how modern adults' combine working life, family life and vocational education and on what demands a successful combination of these three dimensions of adult life defines for appropriate delivery methods and contents in continuing education.

Both the four issues of the electronic journal published so far and the workshops and seminars which have taken place so far have been users/participants and have been evaluated positively by university professors and staff, which shows us that a national collaborative virtual university setting like the one described can reach individual university professors or individual employees in staff development units in universities successfully and inspire them to take up or further develop virtual teaching methods.

In order to move from the concrete activities of the case studied to a model level and to a discussion of strengths and weaknesses of different collaborative change models in universities and a comparison between such models we need to summarize in more abstract terms what characterize the described case. Basically it must be characterized as a bottom up change model based on the philosophy that university delivery methods will change through individuals at university taking in new ideas on a voluntary basis. So the key characteristic of the model is that it relies on change in delivery methods in universities to happen, because individual university professors get inspired by new ideas and the experience of others (McDrury and Alterio 2002, Zucker Kozma 2003) and therefore feel obliged to change their own existing delivery methods. To support individual voluntary intake of new ideas quality information about and descriptions of experience with in this case the newest virtual learning delivery methods and themes must be offered. Characteristic of the described case is that the creation and presentation of this crucial pool of quality information and descriptions of relevant experience in order to support change happens in a collaborative setting where the resources of twelve universities are united to secure both quality and relevance of the offered information and materials.

An analysis of the described collaborative bottom up model based on individual voluntary intake of new ideas leading to change of existing delivery methods at universities shows that such a model has both strengths and weaknesses, but that that the strengths outweighs the weaknesses.

The collaborative setting must without doubt be characterized as strength. No university could on its own run an electronic journal and offer enough relevant experience by its own professors to create the necessary pool of information and experience to support intake of new ideas and change of delivery methods by professors in all subject areas. Couldn't we then do without a journal and without experience descriptions from professors you might ask, and in that way avoid collaboration? Evaluation of the activities of the portal shows that this would not be a promising way to go. The fact that the portal described - because of its collaborative setting - has been able to offer resources and activities which are well known and accepted for knowledge sharing in the academic community, e.g. a journal and seminars with contributions from other university professors who are like yourself, has secured its success. A danger related to all collaborative models, e.g. that they are not able to understand, reflect and secure a close connection to what is going on on a more detailed level within the individual collaborating bodies has been met in the described case through involving experts from all universities in the collaboration. Whether this aspect of the model will work in the long run time will show.

Analysis of former change experience in universities and also of this change model shows that the individual approach of the model may turn out to be both a strength and a weakness. On one hand individual intake of new ideas leading to change is experienced as an appropriate model according to surveys among university professors. They feel that such a model respects their integrity and acknowledges their individual responsibility for delivering courses with appropriate methods and contents. On the other hand it is surely a problem that individually based bottom up models have problems overcoming change barriers and reaching out to professors who are not by themselves interested in

changing their delivery methods. Such models have no solution as how to handle resistance against or lacking interest in renewing university teaching methods here by means of ICT.

To conclude, a collaboration among universities – here on a national scale – based on a bottom up philosophy where individual university professors are supposed voluntarily to change their own delivery methods because they feel inspired by information and materials offered to them in the collaborative setting must – at least in the studied case – be characterized as successful and a promising way to go for supporting the eCompetence of individual university professors and also for further renewal of university activities. The amount of relevant resources offered because of the collaborative setting and the nearness to the daily activities of each professor because of the bottom up approach are the two main success parameters of this model. University professors not interested themselves in engaging in use of ICT and therefore in becoming eCompetent must be reached through other models.

An International Collaborative Initiative – The European eCompetence Initiative

The European Commission has launched an eLearning Initiative and Action Plan to ‘foster the adaption of the European Union’s education and training systems to the knowledge society, through the effective and relevant use of information and communication technologies and the Internet for learning (e-learning)’ (Official Journal of the European Union 19.7.2003). As part of the eLearning Initiative and Action Plan calls for proposals were issued in 2001, 2002 and 2003 and a number of pilot projects and strategic projects have been launched. One of these projects, to be studied here as our second model of university change related to ICT implementation, is the eCompetence Initiative for Higher Education Staff, coordinated by the University of Dortmund, Germany.

The eCompetence Initiative involves twenty European partner universities, four of which function as sub coordinators. Department of Education and Learning, Aalborg University, Denmark, is one of these sub coordinators.

The eCompetence Initiative contains three main activities:

- 1) a field analysis of existing ICT training programmes for teaching staff in European universities
- 2) field research on strategic integration of eCompetence and the development of eCompetence in universities
- 3) sharing of knowledge and experience among competence development units in a number of European universities

The eCompetence Initiative is like more advanced change initiatives in education and in organizations as such based on an understanding of eCompetence as having both individual and organizational relations and implications (Klippert 2000, Schratz, Iby and Radnitzky 2000, Senge 1990). Therefore making university staff and universities eCompetent, which as mentioned above, is one of the problems and challenges when introducing virtual teaching and learning methods into universities, involves both individual eCompetence training programs and the formulation and implementation of institutional ICT strategies. A first work package from the eCompetence Initiative will in accordance with this be a sample of good practices in the field of both ICT training programmes for teaching staff and strategic integration and implementation of eCompetence on an organizational level in European universities. In a second phase in depth studies will be carried through of some of the most promising programs and strategic examples. The project, which runs until 2006, will disseminate its results and the produced sample of good practice and in depth studies through electronic news letters and various seminars and papers.

The target group of the produced materials and the activities in the eCompetence Initiative is the staff development units in universities (Kahn and Baume 2003). The idea is to set up a community of practice (CoP) between these units, focusing on eCompetence in universities, and have the produced samples of

good practice and in depth studies serve as a starting point and basic resource for such a community of practice.

From a model perspective a project like the eCompetence Initiative must be characterized as something in between a bottom up and a top down model for university change related to ICT. Whole units in universities are addressed – not individuals as in the above model. On the other hand there need not be strong strategic links between the activities of such units and management plans for the university. Therefore the above analysis of the model as constituting an in between model with traits from both bottom up and top down models. Characteristic of the model is also that it builds on the concept of a CoP (Lave and Wenger 1991, Wenger 2000), which means that the idea is to bring together professionals – in this case the staff development units in universities – to form an active and collaborative working community among professionals who share a common understanding of a specific field (in this case introduction of virtual teaching and learning in universities and the implications this has for training needs and organizational needs) and who are ready to put in part of their own working resources and professional skills to support collaboration and the sharing of knowledge and experience. Therefore CoP always means you are dealing with a collaborative model, but a specific collaborative model, characterized by collaboration among professionals with a mutual understanding of what the task is approached by the collaborative setting and a mutual will to solve this task through active sharing of professional knowledge and experience related to the task.

As a model for change in universities the second studied case is based on the philosophy that change does not come but itself or voluntarily – as in the previous model above – but that change needs nursing and conscious activities by persons or units on a higher level in the organization than that of individual university professors. Theory talks about such persons and units as change agents. In this case university staff development units are looked upon as exactly such change agents whose job is to support change in universities through communication and interaction with individuals and other parts of the university. Literature describes the need for competences which must be present in change agent units in order for them to succeed. The idea of the CoP model is to secure the presence of the needed competences through collaboration.

A collaborative CoP model as the one described must be said to have many strengths. The amount of competences and the level of competences needed for success in change agent units may seem quite overwhelming when described in literature. Therefore a collaborative model must be evaluated as a strong model, since it establishes a huge common pool of resources adding the competences of the individual participating bodies together. When the CoP is established in an international setting, as in the studied case, it is the more obvious that a CoP means access to resources which you would not be able to establish on your own. Confronting own ideas and experience with ideas and experience from other cultural settings, which are very different from your own, always make you wonder and think and consequently creates a need for you to formulate more explicit arguments and explanations as to why you act the way you do in your change work – a highly needed communicative competence in being successful in university change activities involving university staff who from the start do not necessarily define and interpret needs for change the way you do.

Another strength of a CoP model among staff development centres is that it helps overcome a crucial barrier against change in traditional university culture mentioned above, e.g. the individualism of university culture. By creating a huge pool of resources the CoP builds enough strength in each of the collaborating university staff development units to be able to engage in overcoming the individual approach of traditional university culture and serve as true change agents, helping create incentives for change.

A weakness of the described concrete CoP model is, however, that it is being set up in a project setting, since there is always a danger that results from projects do not survive when project money runs out. The Ecompetence Initiative like any project has to be very aware of this.

A Global Collaborative Initiative – The International Association of University Presidents

The International Association of University Presidents (IAUP) is an association under the auspices of UNESCO for university presidents (vice chancellors, rectors) worldwide. The association is being run by an executive committee which forms subcommittees and working groups to support its work. For several years the association has had a standing technology committee to help the members of the association implement ICT in their universities in a better way than they would on their own. 1999-2002 staff from Aalborg University's Department of Education and Learning chaired this committee in cooperation with one of the vice chancellors in the executive committee, Professor Ed Walsh, Ireland. Before 1999 the technology committee was chaired by the University of Sacramento, California. Now it is being chaired by an Australian University, the Edwin Cowan University in Perth.

During its whole lifetime the technology committee of the IAUP has been producing resources for the members of the association, e.g. for the top management level of the member universities in the association to promote use of ICT in universities (Lorentsen 2001). During the Sacramento period a database of key concepts related to ICT and to the implementation of ICT in universities was created to raise the awareness, knowledge and understanding of vice chancellors as to what constitutes main problems and challenges when introducing ICT into universities. After 1999 a collection of best practices in use of ICT in universities and especially in use of ICT in university teaching and learning activities has been produced. The objective of the best practice collection is to inspire vice chancellors through success stories related to ICT from other universities.

Both resources have been designed and created in a global collaborative setting, the members of the technology committee representing different continents and many countries, and they have also been evaluated in a truly global setting by the members of the association, representing countries covering all parts of the world.

The target group of the endeavours of the technology committee of IAUP is as mentioned the top level of universities, aiming at supporting vice chancellors of universities in better understanding the field of ICT and in supporting their implementation of ICT, and virtual teaching and learning methods, by grounded strategic visions, decisions and actions.

On a model level this third case is representing a top down model, which is based on a change philosophy that stresses the importance of visions and actions from the top level of universities in order to be successful in the field of ICT implementation in universities, not necessarily relying on traditional ideas of organizational change alone, but also with inspiration from new organizational ideas (Czarniawska and Sevón 2003). It is also a collaborative model, creating change resources in a collaborative setting in its broadest sense, being based on collaboration among experts and vice chancellors on a global scale.

A collaborative top down change model focusing on competence development and inspiration on the highest management level in universities is a rare finding. Such a model has much strength, however. Firstly a top level collaboration may focus totally and solely on exactly the needs of this top management level. Secondly the collaboration happens between equals, which means that the danger of losing face is minimized compared to a multi level collaborative setting. That the collaboration in the studied case happens within a truly global setting is strength in itself. Knowledge of similar problems and challenges as your own and their solutions in other cultures makes you think harder and search more for the right vision

and solution in your context instead of settling with already well known but not necessarily optimal visions and solutions applied in your neighbourhood.

An association as the framework for global collaboration on ICT problems and challenges is, however, a vulnerable setting. When the presidency of the association shifts, which in the studied case happens every three years, the weight put on ongoing activities, such as the collaboration on ICT problems and challenges may change. In the case of the IAUP this seems to have happened to some degree. Another weakness of a collaborative model related to the top level of universities is that vice chancellors as very busy persons end up having little time for using and profiting from the collaboratively produced resources, simply due to working overload.

All in all it seems, however, that a collaborative top down change model related to the top level in universities and implemented in a global setting has more strengths than weaknesses, and in many cases it may help overcome organizational barriers for ICT related change in universities stemming from lack of knowledge, inspiration and visions at the top level.

CONCLUSION

Above three different models for supporting ICT related change in universities have been presented and analysed. In all three cases collaboration seems to be strength, be it on a national, international or global scale. Therefore it seems legitimate to conclude that universities should choose some sort of collaborative setting to support their introduction of virtual teaching and learning methods.

The studied three cases represent different kinds of collaborative settings. The question is whether some of these are more appropriate than others when universities engage in collaboration with other universities.

The first model represents collaboration to support a bottom up change model in universities, where individual university professors are supposed to change their delivery methods voluntarily as a consequence of being inspired by a huge pool of knowledge and experience in the field of virtual teaching and learning, having been produced by the collaborating bodies. This model is evaluated as very successful by individual university professors interested in change, e.g. it serves the purpose of making them eCompetent, because it communicates with them on their own terms. The same model has, however, some serious difficulties in reaching university professors who are not themselves interested in change or who are directly opposed to change, for different reasons.

The second and the third model try to overcome organizational barriers against ICT related change, both of them creating incentives and motivation for change through a visible organizational interest in change and competence development and other strategic measures to support change. Both the second and the third model stress active and explicit organizational change activities and do not rely on – as in the first model – individuals in universities to change voluntarily, but they stress and take care of different aspects of organizational involvement in ICT related change. The second model supports the presence of needed change agent competences through a community of practice model. The third model is a more traditional top down model in the sense that it stresses the need of top management in universities to have appropriate knowledge and inspiration in order to be able to influence and cause change to happen through strategic measures initiated at top level. Both models therefore serve different purposes and consequently they must be termed supplementary rather than alternative models.

All in all the studied cases and models therefore show that universities should engage in collaboration to support a for many reasons necessary introduction of virtual teaching and learning methods. Since collaboration may take on many shapes, a conscious choice of collaborative models is needed from universities, if they will profit optimally from their collaborative efforts. Three different models of

collaboration have been analysed and discussed above. All of them have turned out to have strengths and weaknesses. Therefore a combination of them instead of choosing only one seems the most promising way to go for universities, which have resources enough to engage in all three kinds of collaborative activities. Universities with fewer resources have to choose. Making a conscious choice based on knowledge of the strengths and weaknesses of individual models will, however, make it more likely that universities prosper from the collaborations they join. Therefore a study of different collaborative methods should be an important endeavour in all universities before actually engaging in collaboration.

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Losike-Sedimo, N. and Reglin, G. L. The University of Botswana, Botswana. The Impact of Telepresence Teaching and E- Learning on University Students' Achievement and Attitude: A Challenge for Sustainability

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ABSTRACT

The perspective taken in this paper is that technology is seen as enabling the on-line instruction and not as an end in itself. And that where an institution incurs significant cost for innovations with no significant change in the culture of learning there is a cause for concern. The paper presents the results of a study on the influence of telepresence on university students' achievement and their attitude within a multimedia learning environment. These are then discussed in the context of sustainable development. The researchers used a 3-group experimental design and examined hypotheses for telepresence effect, learning style effect and the interaction effect of telepresence and learning style. Data collected included pretest scores on achievement and attitude as covariates and were analyzed using the multivariate analysis of covariance statistical model MANCOVA. The results suggested that education practitioners could improve learning experiences by incorporating telepresence in instruction. This report excludes results for the other two hypotheses due space limitations.

INTRODUCTION

E- Learning and on-line instruction transcends geographical and cultural borders. Most universities offer distance education through on- line teaching as a regular practice for graduate and under graduate levels. The University of Botswana is among those universities that embrace student centered, technology enhanced pedagogies for on-line instruction, as well as curriculum across the cultural and geographical borders. This paper seeks to address the concepts of innovation and sustainability of on-line teaching in higher education in a developing but stable economy and culture. The paper reports the influence of telepresence teaching on achievement and attitude of university students. The landscapes of sustainable development in instruction are defined and explained in terms of the process and products for learning. Innovation is defined and explained in terms of learning and teaching technology. Process include factors that will promote effective coding and decoding of messages of instruction designed for a wide variety of learners located in many differing environments. Such as students' ways of processing information and methods of teaching.

STATEMENT OF THE PROBLEM

The problem addressed by this study was to determine the impact of telepresence on the achievement scores and attitude scores of freshmen students at the University of Botswana.

BACKGROUND OF THE STUDY

The effectiveness of instruction, whether it is mediated or not, depends on the representation of the message communicated (Smith & Ragan, 1999). It is, therefore, important that instructional designers pay special attention to the specificity of details that go into message design. As part of instruction, message design carries out specification of codes and stimuli in greater details than any other part of instruction (Grabowski, 1995). The independent variables investigated in this study lend themselves to

the concepts of message representation details. Telepresence, when examined as a method of telecommunicating, has an inherent quality of organizing information. The stimuli in the mediated communication can be made more powerful or persuasive in order to overwhelm the stimuli in the physical environment. Symbols representing the message could be arranged in alignment with the receivers' prior knowledge and senses (Kim & Biocca, 1997). In addition, telepresence can be viewed as a perceptual process (Coyle, 1997) and how the learners perceive the message is another important feature of message design. Three levels of telepresence in relation to the students' preferred ways of learning were investigated in this study. Telepresence as a method of teaching, is one approach that describes message representations in terms of the receivers' experiences. The approach explains how end users of a particular technology experience feelings of presence as they use the technology. Studies related to telepresence have shown that systems such as multimedia, hypermedia, television, and videoconferencing have the potential to represent messages based on receivers' experiences (Biocca, 1997; Broadbent, 2002; Windelborn, 2002). Such systems, therefore, can be used to relay specially designed messages aimed at experiencing mediated communication through telepresence. In this study, the practical application of telepresence as a probable factor in message design for instruction was investigated within a multimedia environment. The independent variable for the study, was telepresence-based teaching with three levels: (a) low, (b) moderate, and (c) high, was investigated. The levels were differentiated by the way messages were coded and presented. Telepresence across the three levels of the independent variable was presented in the manipulation of virtual stimuli. Learning style was also investigated. Both the virtual and physical stimuli were designed to affect the learners' sensory information saturation and learning style. The study explored learning style profiles to explore the effect on students' achievement and attitude when presented with one of the three treatment conditions.

PURPOSE AND SCOPE OF THE STUDY

The purpose of this study was to investigate the possible influence of telepresence and learning styles on university students' achievement and their attitude within a multimedia learning environment. The emphasis was in the decoding and processing issues related to learning styles and telepresence; for example, issues such as (a) choices, (b) troubleshooting, (c) decisions made about physical and mediated environment, (d) perception of task, and (e) processing activities. Generally, what type of learner can take advantage of specific benefits of telepresence was described in this study. The effects of the independent variables individually and the interaction effect of both variables were investigated; therefore, the scope of the study was on a pragmatic level rather than on the theoretical level.

SIGNIFICANCE OF THE STUDY

The significance of this study lies in its effort to analyze the experience of learning when the teaching medium employs telepresence and accommodates different learning styles. It is expected that the knowledge gained from this study will benefit instructional designers and teachers. Despite the many studies that have been conducted, there is still not enough empirical information on how best to arrange the interaction between the mediated instruction and learner experience (Enomoto, Nolet, & Marchionini, 1999).

OPERATIONAL DEFINITIONS

AERO and ACCE. Acronyms for active-reflective processing dimensions (AERO) and abstract concrete perception dimensions (ACCE) of Kolb's learning style.

Bipolar dimension. Processing and perception dimensions of Kolb's learning style. The processing dimension is called active reflective, and the perception dimension is called abstract-concrete. *High telepresence level.* Messages with the most breadth, depth, visuals, and animation and interactivity.

Interactivity. Number of responses that the learner has to do in a given lesson. *Learning stimulus.* Physical environmental objects, activities, or events.

Learning style. Unique ways learners process and perceive information in instruction. *Learning style dimension.* Describes learners' experiences by classifying cognitive behavior as concrete, reflective, abstract, and experimental. These four classifications form two bipolar dimensions of a learning style type (Kolb, 1984).

Learning style inventory, LS I, an instrument for profiling learning styles

Low telepresence level. Messages with less breadth, depth, visuals, animation and interactivity.

Medium attributes. Features such as rapid, nonlinear access to multiple forms of information.

Moderate telepresence level. Messages with more breadth, depth, visuals, and animation and interactivity. *Processing speed.* How fast or slow a learner can go through a task, concept range and maps, variety of concepts, and patterns used in coding and decoding messages.

Innovation: Incorporation of technology enhanced teaching

Telepresence. Simultaneous presence of both the communicator and the communicant created by variations in the depth and scope of the message in visuals and interactivity.

Telepresence level. Combination of vivid images, text, animation, and interaction used in multimedia presentations to create special effects that cause sensations and feelings of presence as well as empowering perceptual processes.

Vividness of information. Visual quality in representations of messages.

LITERATURE REVIEW

Introduction

The literature review for this study begins with broad discussions of generic concepts of telepresence and learning. Several learning theories are discussed Previous and current research pointing to why telepresence should be of concern to educators is also discussed.

Conceptual Framework

Buxton (1999) described telepresence as a philosophy of instructional design. Several different theoretical perspectives have also emerged from the literature. For example, Coyle (1997) argued that telepresence is perception of environmental stimuli, while Steuer (1992) equated it to virtual reality and discussed it in terms of mediated communication. Some of these perspectives are discussed below in order of importance to this study.

Information Processing Theory Perspective

In a classroom setting, perception of environmental stimuli may determine how students take in content and understand it. There is no single explanation about how students perceive and process information. One of the many explanations can be found in information processing theory. Information processing theory has been described by Catalano (1999) as a theory of tracing the progression of information through a system from the initial stimuli up to and including the final response. It also has been presented as a linear model that metaphorically portrays the learner's brain as a computer (Atkinson & Schiffrin, 1968). The computer metaphor view suggests that the learner takes in information through the senses and sends it to the short-term memory. The brain then performs complex transformations on the sensory information as if it were a computer. From the short-term memory the information is sent to the long-term memory where it is stored. Finally, the transformations end by producing data representations or behavior (Samuels, 1998). Such an output can be retrieved and exhibited as data whenever needed from the long-term memory. If telepresence is to be perceived as a perception process of environmental stimuli, then telepresence can be understood from the information processing theory. Reeves and Reeves (1997) explained telepresence as a sense of being there, resulting from a combination of automated perceptual processes, mindful direction of attention, and the conscious act of interpreting the view as real. In other words, technology presents the environmental stimuli, which triggers attention, perception, coding and decoding, and the consequent complex transactions and cognitive processes that are operational as the informed person processes information. Coyle (1997) explained and defined telepresence as the mediated perception of an environment which is created by interactivity and vividness. The definition also included

the perceptions of being there in the mediated world as a participant. In general terms, information processing theory purports that people's perceptions of their environment are governed by the information received by their senses; the underlying assumptions being that the sensory impressions accurately reflect the nature of the environment surrounding them. So, perception of environment is central to the process of taking in data and interpreting it; basically, that is what Coyle's definition is expressing.

Technological advances have made it possible to create different sensory impressions for the observer. These impressions may either be obtained from a remote source or artificially contrived. When sensory impressions are obtained from a remote source to create feelings of presence, the method is called telepresence, and when the impressions are artificially contrived, the method is called virtual reality (Griffin, 1991). Telepresence can, therefore, be perceived as a perceptual event associated with the whole activity of information processing.

Communications Theory Perspective

Schramm's communication theory (as cited in Hackbarth, 1996) is about how information is sent between the originator of the message and the receiver of the message and describes how the communications loop is completed. According to Schramm, communication is a process of sending and receiving messages through a medium, using agreed-upon codes within a given background or context. The sender originates the message and sends it in a coded form that the receiver understands. The receiver decodes the message and sends feedback to the sender. The process is cyclical; as the sender receives feedback, he becomes the receiver and decoder, and in replying to it, later creates and codes a new communication for the original receiver, becoming the sender again. The circle goes on and on (Heinich, Molenda, Russell, & Smaldino, 1996).

As a term in communication, *telepresence* is used broadly to refer to teleoperating and virtual environments (Draper, 1998). The idea of simultaneous presence of both the sender and the receiver of information in the communication process is emphasized. Buxton (1999) described telepresence as a social interaction between humans over distance and time, mediated by technology. An example of such an interaction could be an e-mail sent from professor to student or vice versa. Telepresence has also been defined differently by Steuer (1992) as the extent to which one feels present in the mediated environment rather than his or her immediate physical environment. For example, students could be watching a video about their school football team and be immersed in the virtual environment (which is the projected or communicated message) to the extent of feeling like participants in that environment. Reeves and Reeves (1997) emphasized human interaction or experience, active participation by the receiver, and the strategies or manner in which this interaction takes place (conscious act of interpreting the view as real) as key factors of telepresence. In a nutshell, telepresence (in terms of the communication theory) refers to reactions of receivers as they experience the mediated messages.

Research on Telepresence

While the study of telepresence can be pursued as an end in itself, most studies recommended that the experience of telepresence should be correlated with its causal factors of human information processing (Biocca, 1997; Lombard & Ditton, 1997). The majority of reviewed literature explored the relationship between telepresence and cognitive variables (Eagly & Chaiken, 1993). A number of studies explored what causes telepresence (Biocca, 1997; Gerrig, 1993; Held & Durlach, 1992). One common result or theme prevalent in the different studies is how the construct of telepresence works and how it has been operationalized in research.

According to several studies, key determinants of telepresence are (a) the balance of information stimuli in the mediated environment, (b) the information stimuli in the physical environment, and (c) the user's immersion of senses in the presented information stimuli (sometimes called proximal stimuli). Another

factor stated as a determinant of telepresence was accessibility of information. Stimuli from the virtual environment and the physical environment compete for the user's cognitive accessibility. A combination of the user's traits and state of mind was reported to have influences on the experience of telepresence. In some experiments, researchers used the concept of sensory saturation or sensory suppression. The saturation was increased or decreased by manipulating information available in the media and distractions in the learning environment. In these studies, technology served as a medium that connects the sender and the receiver (Krueger, 1991).

In another study, a view that telepresence is equivalent to virtual reality was pointed out. Steuer (1992) contended that the user is not necessarily the receiver but the experiencer of virtual reality created by the communicated information. The view that this researcher chose to follow is that the tutor's presence can be experienced using multimedia programs and telepresence technology. In the proposed study, the information stimuli in the virtual environment are designed to overwhelm the physical distractions in the room and other created physical environmental stimuli. Depending on the learner's state of mind and preferred method of study and task, the information should attract the learner's attention. In Steuer's (1992) study, vividness was not found to affect the feelings of telepresence. On the other hand, Coyle (1997) found no effects for interactivity, interaction, and vividness on the subjects' perceptions; however, positive attitude change toward the design and instructional method was observed.

Multimedia and Learning Styles

Research on both hypermedia and learning styles and multimedia and learning styles showed that multimedia applications could offer techniques (e.g., explicit cueing) that could help the less able students perform better. Information on how the multimedia features drive the design shows that the multimedia learning system offers multiple techniques for achievement improvement (Dillon & Gabbard, 1998). Erwin and Rieppi's (1999) study showed that a large number of students could be taught more effectively in multimedia classrooms. Multimedia makes it possible for the instructor to present information in a manner that is faster and more organized, detailed, visually appealing, and open to student interaction than a lecture method. Multimedia can also demonstrate conceptual interrelationships and multiple perspectives of a complex topic (Cobourn & Lindauer, 1994). It is, therefore, suitable to use in this experiment so as to accommodate varying learning styles. Previous research also reveals that linear, hierarchical, and Web structures in multimedia presentations are favored by certain learning styles and not others (Bagui, 2000; Rasmussen 1996).

Telepresence and Learning Styles in Instructional Design

The combination of communication, learning, and instructional theories forms the foundation of this study. The theories are integrated to define message design as a component of instructional design; the focus is in the part of instruction that contains the physical form (actual presentations) and the inductive composition (students' learning) of the message. The theories are used to formulate a step-by-step plan for instruction. A study by Chou and Wang (1999) revealed that computer-based instruction, which accommodates students' varying learning styles, can influence achievement and attitude; however, studies relating telepresence and learning styles were not located by this researcher. Draper (1998) discussed telepresence and cognitive behaviors and recommended more experiential research on telepresence and its cognitive correlates.

Telepresence, Achievement, and Attitude

Visual representations, which are a characteristic of telepresence, have been observed to assist the learner in organizing and integrating task information. Montague (2000) observed that the representation process of a task or activity is critical to effective problem solving. Task difficulty, which has also been correlated with self-perceptions of ability and academic competence, has been reported as influenced by the perceptual information processes (Szabo & Poohkay, 1996; Montague, 1997). In turn, task difficulty

perceptions also contribute to academic achievement (Meltzer, Roditi, Houser, & Perlman 1998). Many studies in computer-based education (CBE) or computer-assisted studies revealed that using computers in instruction influences achievement and attitude positively (Kulik & Kulik, 1991; Reed, 2003).

Student Learning Experiences in Virtual and Physical Environments

Effectiveness of one environment against the other would be hard to demonstrate. The use of a virtual environment will not necessarily yield improved results and may even cause confusion to the user; however, the literature contains examples of successful and unsuccessful uses of multimedia in both environments. For instance, Owen (1998) designed a multimedia-based instructional program that failed to facilitate improved learning in the experimental group compared to the control group. Instead, it took the experimental group longer to achieve the same learning results. One of the explanations given for failure was that learning styles were confounding variables in the research designs. Chou and Lin (1998) stated that difficulties in demonstrating the efficacy of hypermedia might be due to the existence of varied student learning styles and suggest that a single approach to hypermedia system design would not be effective for all types of learning styles. In the proposed study, different approaches directed at different learning styles would be used over a period of 15 weeks and would control for learning style as a confounding variable. Another weakness cited in virtual environments is the lack of familiarity with computers or a specific electronic environment in question (Schroeder, 1994).

METHOD

Research Design

A three-group pretest and posttest experimental design was used in this study (Fraenkel & Wallen, 1996; Gall, Gall, & Borg, 1999). Participants were randomly assigned to the 3 treatment groups. While in the 3 treatment groups, participants Completed the achievement and attitude premeasures. Participants learning styles were profiled and then exposed to three different levels of telepresence treatment over a 15-week period. At the end of the 15-week period, they completed the achievement and attitude post measures.

Population and Sample Selection

All first-year students enrolled in the College of Education at the University of Botswana formed the population of the study. From a total of 500 students ($N = 500$) registered for different subjects, 130 students in an educational psychology course were selected using the cluster sampling technique. The psychology course was chosen because it was a new subject to all participants. The ethnic composition of the 500 freshmen was 55% minority tribes and 45% majority tribes. The majority of the students were between the ages of 19 and 40. All the students were residing either in the dormitories or at home in urban locations.

Participants

The participants in the study were 116 students from the University of Botswana in Gaborone. These were the student who had consented to participate from the initial total of 130 students. Fifty percent (50%) were minority tribes and 45% majority tribes. The majority of the students (75%) were between the ages of 19 and 40. All the students were residing either in the dormitories or at home in urban locations.

Independent Variables

Telepresence and Learning styles were the independent variables. Learning styles was examined at two levels with three levels of Telepresence. Two bipolar dimensions of Kolb's LSI represented the learning style levels. These were the active versus reflective dimension (AERO), which describes how individuals process information, and the abstract versus concrete dimension (ACCE), which refers to how information is perceived The three levels of telepresence were described as (a) low, (b) moderate, and (c) high. Each level was incorporated in one of the three instructional methods used in the study. .

Dependent Variables

The dependent variables were (a) achievement posttest scores and (b) attitude posttest scores. Achievement was defined as the results obtained from an educational psychology achievement test. The achievement test was an annual exam used by the division of educational psychology to determine who proceeds to the 2nd year. The test had established reliability and validity. An instrument that was discovered in the literature measured attitude. Selection of the independent and dependent variables for this study was purposive and supported by several research studies as important factors in the learning process (Braio et al., 1997). For example, Angelo (1998) found a relationship between attitude, achievement, and motivation where motivation promoted effective learning.

Hypotheses and Research Questions

Three research questions and three hypotheses were formulated to examine (a) the telepresence effect, (b) the learning style effect, and (c) the interaction effect of telepresence and learning style.

Instrumentation

Five instruments were used. (a) attitude survey, (b) achievement test, (c) demographic survey, (d) Kolb's (1999) revised LSI, and (e) Telepresence survey.

Instructional Materials

Instructional materials included course syllabus, textbooks, 3-1/2" floppy diskettes, three CD-ROMs, video clips and other compiled learning materials constituted the instructional materials.

Treatment and Groups

There were three treatment groups. The instructions for the groups were similar and were written in the instruction and assignment book. Group 1 was exposed to the low level of telepresence which was defined as messages with (a) less breadth and depth, (b) few visuals, (c) less motion, (d) less animation, and (e) less interactivity. The message design for this group consisted of a very basic and simplistic content in which comprehension was enhanced and simplified by special effects that the literature defined as elements of telepresence. Group 2 and group 3 had more and most of these special effects respectively. The difference among the three versions varied in terms of how the screens were designed and the intensity of telepresence portrayed.

Data Collection

Participants were randomly assigned to treatment groups using their identification numbers obtained from the demographic survey. Three teachers who had been randomly assigned to the 3 experimental groups helped with the administration of the above mentioned instruments and grading student work. Each group had been pretested on attitude and achievement. Having been subjected to the treatment, which was different levels of telepresence as an instructional method, the participants were given a posttest.

Data Analysis

Descriptive statistics (Lomax, 1998) and multivariate analysis of covariance (MANCOVA) were used to analyze the data. According to Stevens (1996), MANCOVA is the appropriate statistical model to use when there exists more than one dependent variable. Mertler and Vannatta (2002), concur with Stevens's contention.

RESULTS

An examination of the results revealed differences in means for the three groups. The high telepresence group appeared to have the highest posttest achievement mean ($M = 85.00$, $SD = 5.46$) and the highest posttest attitude mean ($M = 84.00$, $SD = 8.70$). The moderate telepresence group had the second highest posttest achievement mean ($M = 80.50$, $SD = 8.17$), and the second highest attitude mean ($M = 82.69$, $SD = 10.05$). The data suggest that high telepresence could increase achievement and attitude scores for students. MANCOVA results for the effect of telepresence on achievement and attitude revealed that there was a statistically significant effect for telepresence on achievement and attitude scores, Pillai's Trace = .65, $F(4, 222) = 26.07$, $p = .01$. Additionally, for achievement, the univariate F tests determined that the mean differences were significant for all the telepresence groups. For attitude, the univariate F tests depicted that the mean differences were significant for the low telepresence group and the moderate telepresence group. Multiple comparison and post hoc testing were conducted using the Bonferroni procedure. The test results suggested that the three telepresence group posttest means were statistically different from each other. The comparisons led to the rejection of the null hypothesis that telepresence will have no effect on achievement and attitude. The data strongly suggest that telepresence could increase students' achievement scores and students' attitude scores

DISCUSSION

Hypothesis and Research Question.

Telepresence will have no effect on achievement and attitude scores. How does telepresence relate to achievement and attitude for college students? Results for Hypothesis and Research Question provided evidence that telepresence-based instruction influenced both attitude and achievement scores. The results were expected because previous research (Dillon & Gabbard, 1998) revealed that how the learner experienced technology was related to achievement. Elsewhere, research on advertising showed that telepresence highly influences attitude (Coyle, 1997). Telepresence has been shown to improve comprehension and time on task as well (Kim & Biocca, 1997). Time on task and complexity of task has been related to achievement and motivation (Angelo, 1998). In an extensive review of the literature, the researchers discovered several other major and interesting studies that support findings for the Hypothesis relative to the effectiveness of technology in increasing achievement. In recent studies, Reed (2003) and Hancock, Bray, and Nason (2002) found that there was a significant difference for achievement and attitude when instruction employed multimedia. Similarly, Keegan (2002) and Ma and Bateson (1999) discovered that students perceived and understood information better and were able to retain information for longer periods of time when learning in a multimedia learning environment. Furthermore, Windelborn (2002) reported that there are many possibilities for using telepresence in teaching at any level. Also located in the literature were several meta-analysis studies that clearly confirmed the findings for the Hypothesis relative to technology enhancing achievement and attitude. Kulik (1980) completed several of these studies on university students.

In her review of higher education studies, Kulik discovered that computer-based education (CBE) dramatically influenced student achievement. Student' scores were raised by 20 points. A 1987 meta-analysis of college students revealed that CBE raised student achievement by a standard deviation of 0.26 (Kulik & Kulik, 1987). In their 1991 meta-analysis, Kulik and Kulik (1991) included 199 studies and found a positive effect on achievement and attitude. Not only was technology effective for university students, but also myriad and diverse studies demonstrated effectiveness at the high school level. For instance, in a meta-analysis of the effectiveness of computer-assisted instruction (CAI) in science education by Bayraktar (2002), a positive effect on student achievement in science education was reported. The researcher concluded that incorporation of CAI in science education could be beneficial. This finding was consistent with the Christmann and Badgett (1999) study. These authors had found a positive effect of CAI on achievement. The two studies reported a small effect size of 0.20 and 0.27 standard deviations respectively. Bayraktar also detected significant differences in effectiveness for different CAI implementations. The results of his study indicated the most effective mode of CAI for the

science subjects was simulations. In addition, numerous studies that isolated technology and attitude demonstrated that technology can also change students' attitudes.

In a study by Marshall and Bannon (1986), CBI such as drill and practice, and simulations were found to be some of the innovations that were very effective in teaching. Marshall and Bannon conducted a survey study to assess the students' attitudes toward CBI. The survey assessed 2,302 students from grade 7 to university level. Marshall and Bannon found a positive relationship between attitude and computer knowledge. Among other things, students were optimistic about being taught by a computer. In the same study, respondents reported major improvements in the learning and teaching settings due to the use of drill and practice and simulations. In a study by Loyd and Gressard (1984) on attitudes toward computer usage in the classroom, the results suggested that the students had a positive attitude toward CBI. Marshall and Bannon additionally concluded that computer experience could be linked to academic progression.

IMPLICATIONS FOR EDUCATIONAL PRACTICE

Telepresence-Based Instruction and Sustainable Development

Professors and designers can conduct careful learner analysis to create scenarios in which well-designed technology lessons can facilitate the learning process. Kozma (2000) emphasized the need to focus educational technology research on design as well as on technology. Kozma suggested that what should distinguish the field of educational technology is designing with technology and conducting research that examines the relationship between design and technology. Kozma discussed technology as enabling new designs, not driving the design. This study fits Kozma's description of designing with technology and has clearly demonstrated that the process of technology enabling instruction design works. Results for Hypothesis imply that in designing for telepresence, the instructor does not perceive technology as an end in itself but as a good condition for learning. Drawing from such a perspective, it would be beneficial for education practitioners to consider telepresence in their teaching.

Currently, numerous public Web sites on telepresence learning exist. In schools, telepresence capabilities are available. Having telepresence in a classroom requires only (a) a fast computer, (b) a high speed internet connection, and (c) a Web browser. For the whole school, requirements are different. The school, as a provider of telepresence, requires a server capable of providing audio, video, and multiple video signals to the user. In his article on telepresence teaching, Windelborn (2002) explained that there are many possibilities for using telepresence in teaching. For example, he mentioned the videoconferencing capabilities. These were programs like Microsoft's NetMeeting and White Pine's CuSeeMe. Universities choosing to use telepresence are already in possession of computers and servers. It would, therefore, be reasonable to reap the benefits of telepresence-based instruction using the already available equipment. However there is a downside to the use of telepresence teaching. There are issues of technological frustrations and sustainability factors. Technical frustrations include equipment that malfunctions as in the server that is always down, leaving the instructors and students frustrated. Sustainability factors include wearing off of the novelty of the innovation, introduction of newer and faster hardware and software, rapid changes in the economic status of the university, instructors who cannot cope with rapid technological changes, cost effectiveness of on-line teaching compared to other methods such as traditional classrooms and use of print materials, attitudes of both students and instructors rooted in the existing learning and teaching culture. Garland (1995) in Angling's (1995 p 285) Instructional technology book suggests several strategies and approaches for overcoming barriers to excellence and sustainability. According to him, overcoming people issues needs commitment and user acceptance from the top most managers to the lowest employees. He also observed that constant formal training is a necessity. Concerning cost issues he recommended that the institution should take a life cycle cost benefit approach to training development and delivery. While the training cost may be higher, it may yield substantial delivery savings over time. To overcome infrastructure issues, the existing equipment should be upgraded, new technologies should be accepted and supported by end users. In addition he recommends that the

innovation should be culturally and structurally appropriate. Rossner and Stockley (1997) in Khan's (1997) book *Web-Based Instruction*, suggested that on-line instruction be used as source for revenue to solve cost issues, that institutions develop clear and multifaceted vision of what is possible to do within the constraints of their own particular community. At the University of Botswana, efforts are continuing to restock the entire university, updating classrooms and lecture halls, placing computers on faculty member's desks, building and expanding the library multimedia lab, putting more computers on each floor of the library, registering more students on on-line courses and training of faculty and staff. To sustain these changes, a vision and a mission have been created to guide the innovation. It still remains to be seen what the impact of these changes will be in the next three years. So far the structure is changing while there is no change in the institutional culture of learning and teaching.

SUMMARY

In the context of teaching, Telepresence can be used as a method and can be sustained by careful planning or paying close attention to accuracy and details of technology enhanced instruction. The study on Telepresence clearly indicates that well planned merge of the teaching/learning process and the technological innovation can influence good performance and change of attitude. Universities can enroll many distance education students; there are many prospective students from the private and public sector who are willing to pay high cost for the convenience of accessing university studies in the home or workplace irrespective of their geographical location. Hence strong leadership and coordinated efforts on the part of the university, can implement much more than an up-to-date, well serviced technological infrastructure. For example at the University of Botswana there is adequate expertise on the ground that can foster continuous intake of the students with the needed finance, and develop and sustain high quality academic programs. The programs would in turn attract high quality students willing to pay high costs.

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Table 1

Pretest and Posttest Means and Standard Deviations of the Telepresence Groups for Achievement and Attitude

	Achievement						Attitude					
	Pretest			Posttest			Pretest			Posttest		
Telepresence	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>S</i> <i>D</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Low	38	79.42	7.68	38	63.00	8.20	38	66.89	8.08	38	79.00	9.04
Moderate	39	74.10	11.58	39	80.50	8.17	39	79.87	16.98	39	82.69	10.05
High	39	75.03	10.11	39	85.05	5.46	39	73.87	6.39	39	84.00	8.70

Table 2 Means, Standard Deviations, Multivariate, and Univariate Results of the Telepresence Groups by Achievement and Attitude Scores

	<i>df</i>	<i>MS</i>		<i>F</i>	<i>p</i>
Multivariate test	4			26.07	.10
Univariate tests					
Achievement	92	175.07		10.41	.10
Attitude	92	86.00		2.46	.10
Adjusted posttest means					
	Achievement			Attitude	
Telepresence	<i>M</i>	<i>SD</i>		<i>M</i>	<i>SD</i>
Low	63.32	8.20		79.77	9.04
Moderate	80.49	8.17		81.51	10.05
High	85.00	5.46		84.00*	8.70

Note. The three achievement-group means for low telepresence, moderate telepresence, and high telepresence were significantly different from each other according to the Bonferroni test at $p < .05$.

Miliszewska, I. and Horwood, J. Victoria University, Australia. Towards Quality Transnational Education Programs – A Multidimensional Approach

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ABSTRACT

Much of the research in distance education to date has focused around its effectiveness as a teaching medium, and the use of new technologies for teaching. Little attention has been given to the beliefs and behaviours that need to accompany a technology so that it has the desired effects; these are assumed to follow the introduction of technology and are largely overlooked. Yet these factors impact on the quality of distance education programs, especially in transnational settings where additional cross-cultural issues influence the realisation of educational aims. This paper highlights the need for a holistic approach to transnational education; an approach that takes into consideration various dimensions of the transnational education context, instead of focusing exclusively on technology. The dimensions include student characteristics and practices, instructor characteristics and practices, curriculum and instruction design, interaction, evaluation and assessment, technological characteristics, and program management and organisational support. This selection of dimensions, together with their characteristics, forms a proposed model for quality transnational education programs. The paper discusses the rationale for the multidimensional model, describes its development process, and presents results of its initial validation against three transnational computing education programs currently offered by Australian universities in Hong Kong. The programs were evaluated in terms of the importance of the various dimensions on program quality – as perceived by the participating students. The results of the validation seem to support the premise that technology represents but one dimension of the transnational education context, and that other dimensions also contribute to the program quality. The results also show that the transnational students, irrespective of the evaluated program, are in agreement as to the factors they consider most important to the effectiveness of transnational programs. The paper concludes by discussing the potential application of the multidimensional model in reviewing existing and planning new transnational education programs.

INTRODUCTION

Distance education has been defined as “the physical separation of student and instruction during the education delivery and focuses on independent and self-directed learning” (Holmberg 1980). The distance learning market has become highly competitive, and universities are under growing pressure to develop programs that are not only current, but also relevant and responsive to market needs (Low 1998). Among factors contributing to the growing popularity of distance education programs are: the emergence of new technologies, growing need for new teaching and learning strategies to serve life-long learners, and political and economic pressures (Knott 1992, Lewis and Romiszowski 1996). Economic pressures stem from the general decline in educational funding and the subsequent requirement for universities to engage in income generating activities. Educational technologies (the Internet and World Wide Web, satellite and compressed video, etc.) have matured sufficiently to enable the development of new teaching strategies, and to overcome many of the communication barriers associated with distance education. Interest in educational innovation, methodological concerns, and desire to improve social equality and to serve individual learners are other factors of importance (Knott 1992, Ljoså 1992).

Current distance education programs represent a wide range of approaches. One end of the spectrum, the modern form of the correspondence course, offers technology-exclusive programs, on-line courses relying on computer-based student contact and feedback. The other end offers technology-assisted programs, computer-delivered instruction, electronic mail communication between students and teachers, some centralised face-to-face class sessions, and weekend meetings of cluster groups. The programs have different scopes, from local to international, target a variety of audiences, are offered at

various educational levels, and represent different settings, from classical universities operating at a distance to modern open and flexible institutions.

In recent years a particular stream of distance education called 'transnational education' has become widespread. While there may be many definitions of transnational education, the one used in this research describes that type of education, often referred to as offshore education, 'in which the learners are located in a country different from the one where the awarding institution is based' (UNESCO and Council of Europe 2001).

Education seems to be in a constant state of evolution, and transnational education is no exception; it is supported by theory but in need of research that would address many unanswered questions. Researchers and educators agree that more research and emphasis should be placed on quality and effectiveness of transnational education programs, rather than hardware, software, and bandwidth. Competition for students in the transnational education arena is becoming intense; for Australia, one of the main providers of transnational education in South East Asia, satisfying the needs of highest demand disciplines in the region - computing and business - is of vital importance. With the growing number of transnational education offerings, students will have more choices and will increasingly demand high quality programs. If the programs fail to meet their expectations, they will go elsewhere. In order to attract and retain students, providers must be aware of the attributes that students, teachers, and administrators regard as most relevant to effective transnational education programs.

Distance education is an increasingly common educational alternative as well as a key contributor to the newly competitive landscape in higher education. Once regarded as an experimental alternative outside the mainstream university education, distance education has attained new levels of legitimacy and expansion and has grown into a higher education industry on its own (Merisotis and Phipps 1999). This trend is also reflected in transnational education which, globally, included 1.42 million higher education students in 1998, of which Australia had an 8% market share (Wyatt 2001). According to Jones (2002), the demand for transnational higher education grew by 26% between 1985 and 1992; the growth is set to continue, particularly in South East Asia. It is estimated that the demand for transnational higher education in Asian countries (excluding China) will reach nearly 500,000 students by 2020 (GATE 2000). For Australian universities, the key transnational providers in the region, this presents both a challenge and an opportunity.

Forces Driving Distance Education

Technology is a major contributor to the dramatic growth of distance education. Advances in technology, including computer conferencing, interactive media, digital technologies and the Internet are transforming the world into a borderless educational arena (Bates and de los Santos 1997, Frantz and King 2000).

In addition to advances in technology, there are several other forces driving distance education; one is the transition from Industrial Age to Information Age where intellectual capital is regarded as a valuable commodity. The value of intellectual capital drives the demand for continuing education and emphasises a shortened lifespan of knowledge (King 1999, Cunningham et al. 2000).

The explosion of knowledge, one of the consequences of the Information Age, also promotes distance education. According to Cunningham (2000), it is no longer possible to 'know everything', even about one specialised discipline, so the aim of education must be 'learning to learn'. Therefore, education can no longer be regarded as preparation for work, but rather as a lifelong effort to ensure employability rather than employment (Meister 1998).

Changing demographics are also a driving force in distance education (Ben-Jacob 1998). The traditional high school leavers now represent only a part of the tertiary student population. The new majority is composed of adult learners who seek postsecondary qualifications to maintain and enhance their careers, and not simply to enter the job market. These students demand relevant and accessible continuing professional development programs (Carnevale 1999).

Changing work and social patterns have also had an impact. Firstly, there has been an increase in alternative work arrangements, including flexitime and work-at-home arrangements. This has led to greater individual responsibility and thus increasing learner autonomy (Sherry 1994). Secondly, the rising cost of living and tightening labour market has resulted in an increased number of two-income families. For many, sacrificing one income to return to full-time studies is not an option. Thirdly, there is an increasing need to balance academic endeavours with work and family commitments. Thus students with families and in the workforce demand programs that would fit their lifestyles; conventional time- and place-dependent education is not usually suitable for their work structure and lifestyle (Carnevale 1999).

Declining funds also drive distance education opportunities. Governments are increasingly reluctant to fund growing demand for further education (Dudley 1998), so institutions of higher education need to attract larger number of students to reduce cost of their programs. Universities hope that students will be attracted to distance education programs, and will pay for the opportunity to study while not being restricted by location or time.

Competition is another driving force. The corporate world sees the potential in the educational market and challenges universities by providing alternative courses and training programs to meet the rapidly growing demand. Many corporations are developing corporate universities (Meister 1998). In addition, there has been growth in the activities of virtual and for-profit institutions offering educational programs, commercial companies supporting on-line infrastructure of universities, as well as publishing companies announcing intentions to establish their own universities (Cunningham 2000). Corporations are also promoting distance education course design tools. This marketing effort further increases competition and applies additional pressure on the non-profit university sector to provide distance education opportunities (Blumenstyk 1999).

DISTANCE EDUCATION MODELS

Distance education models are categorised from a number of perspectives. Rumble (1986) and Holmberg (1995) identified three models determined by the organisational and administrative structures of distance education providers, sole responsibility, mixed mode and consortium. Sole responsibility, of which Open University in the United Kingdom is an example, is a model where distance education is the special purpose and responsibility of the institution. Mixed mode refers to institutions where both traditional and distance education occur, such as the Charles Sturt University, and Monash University in Australia. In mixed mode institutions, responsibility for organisation may rest with a single department within the institution, with the institution responsible for administration; or departments may be responsible for both organisation and administration of their own programs; or a dedicated unit within the organisation may offer distance education in a variety of disciplines and be solely devoted to this purpose. Open Learning Institute at Charles Sturt University, and Distance Education Centre at Monash University are examples of dedicated units (Fraser and Deane 1998). The third model, consortium, refers to a group of institutions devoted to distance education. Students may enrol at their own institution, use centrally developed learning materials, and transfer credits to their academic records (Verduin and Clark 1991).

Another perspective used in categorising distance education models is one based on technologies used to support the various components of the instructional process, and the placement of control over the pace and location of instruction. In some models, the teachers and institution have primary control, as is the case in a traditional classroom environment. In others, the control rests with the student. The models identified in this categorisation are distributed classroom, independent learning and, open learning plus class. Distributed classroom is a model where interactive telecommunication technologies are used to extend a program based in one location to students in one or more other locations. The control over the pace and location of instruction rests with the teachers and the institution where the program is based. Independent learning, sometimes referred to as flexible learning, is a model where students learn when, how, what and where they want (Brandt 1992). They are provided with a variety of educational materials for a self-paced study, and access to teachers who provide guidance, and evaluate their work. Telephone, e-mail, computer conferencing and correspondence are used as a means of communication. The presence of two-way communication distinguishes independent learning from teach-yourself programmes (Keegan 1996). Open learning plus class model involves the use of course material allowing students to study independently, combined with periodical use of interactive telecommunications technologies for group meetings among all enrolled students.

Taylor (2001) categorised distance education operations in terms of generations determined by the supporting technologies; first, the Correspondence model based on print technology; second, the Multimedia Model based on print, audio and video technologies; third, the Telelearning Model, based on telecommunications technologies; fourth, the Flexible Learning Model based on the Internet; and fifth, Intelligent Flexible Learning Model, a derivation of the fourth generation, capitalising further on the Internet and the Web.

Fraser and Deane (1998) categorised distance education models in terms of institutional attitudes to distance education. The first model recognises distance education as a mode in its own right. The learning experience is adaptable and learner-controlled. The second model regards distance education as a substitute for conventional education. In this model, students are treated as members of a class, there is a mandatory face-to-face component, and the learning experience is paced and controlled by the institution. In addition to these two models there are many variations that partly resemble either or both of them.

EFFECTIVENESS OF DISTANCE EDUCATION

Distance education is a fusion of two systems, education and technology, to deliver instructions effectively to students at a distance. Therefore the key to an effective distance education program is the effectiveness of its internal systems and the flexibility of the interface between them. Some educators argue that the lack of interaction, student-to-student and student-to-teacher is one of the biggest challenges. Studies show however, that when distance education techniques are used properly, non-traditional interaction can be as effective as the conventional face-to-face interaction (Bernt and Bugbee 1993; Howell and Jayaratna 2000).

The literature indicates that the primary measure of effectiveness of a distance education program is its ability to meet the needs of learners. A program is perceived to be effective if it fulfills the needs of its participants to such an extent that they would be happy to enrol in another similarly designed program (Merisotis and Phipps 1999). The needs of the learners represent individually and socially defined goals that can be achieved in a variety of ways and relate to a number of learning outcomes. Although the ultimate objective of a program is to enable the learners to achieve their goals, the assessment of its effectiveness invariably involves evaluation of factors at two levels of operation: the individual level and the system level. At the individual level, the learning experience, the practical relevance of acquired skills, and satisfaction with the learning experience are evaluated. At the system level, the

evaluation includes the functional, managerial and instructional aspects (Chute, Thompson and Hancock 1999).

Students perceive a distance education program to be effective if they pass examinations, feel that the content of the program is relevant to their needs, have an opportunity to network with other students, feel part of the class and connected to teachers, have opportunities for participation, receive support when needed, experience few technical problems, and feel comfortable with the technology (Neal 1999, Simonson et al. 2000, Stein 1998). Teachers perceive a program to be effective if students are motivated, complete assessment tasks and participate in discussion, use the technology to communicate, pass examination and only few students drop out from the program. Teachers also perceive the program to be effective if the content meets the students' needs, and if the institution provides financial, personnel and technical support.

From the perspective of distance education program developers, effective programs are designed to meet diverse needs of students (Thompson 1998, Keast 1997, Knott 1992). Students in distance education programs have a wide variety of experiences and needs. These diverse student profiles make it impossible to identify the 'typical' student. The effectiveness of a program can be further enhanced by teachers who understand and apply learning theories to the development and delivery of a program (Pallof and Pratt 1999, Trilling and Hood 1999).

From an educational perspective, an effective distance education program should support the universal principles for good practice in education. It should encourage and maximise contacts between students and teachers, develop relationships and promote collaboration among students, incorporate active learning, give rich and rapid feedback to students, stress time-on-task, set high standards for students' performance, and respect individual differences and allow students opportunities for learning that acknowledge those differences (Chickering and Gamson 1987, Chickering and Ehrmann 1996, McLoughlin, Oliver and Wood 1999).

DIMENSIONS OF DISTANCE EDUCATION

To design effective distance education programs, including transnational programs, it is important to understand factors that influence the learning process. Approaches to course design, however, usually focus on the instructional and technological aspects of teaching strategies. These approaches are based on the assumption that the use of new technologies or methods of instruction alone will result in good learning, and fail to consider the factors that influence learners' response to instruction.

Effectiveness of distance education programs is often measured by the programs' outcomes. Research into the learning outcomes of students in distance education has found that they are very similar to those within the traditional classroom (Fox 1998, Sonner 1999). Some authors go so far as to suggest that students in distance learning courses earn higher grades and perform better on standardised achievement tests (Gubernick and Ebeling 1997). The main focus of the research into distance education has been on student achievement and student satisfaction. The outcomes, however, determine if a program was successful, but do not determine why it was successful. According to the literature, it is more important to know why a program was successful than that it met its objectives. As observed by the President of The Commonwealth of Learning, Professor Gajaraj Dhanarajan (1999) "...it is amazing how little is known about the nature, practices, successes, failures, relevance and effectiveness of training and education delivered using distance education" (p. xiii). Merisotis and Phipps (1999) support this view adding that little attention has been given to the various aspects determining the distance education context.

Having examined the various facets of the distance education context including driving forces, delivery models, and effectiveness, relevant characteristics of distance education have been identified. These characteristics, regarded as relevant to the effectiveness of distance education programs in general, and transnational computing programs in particular, were subsequently grouped into broader

categories, or dimensions 1) student characteristics and practices, 2) instructor characteristics and practices, 3) curriculum and instruction design, 4) interaction, 5) evaluation and assessment, 6) technological characteristics, and 7) program management and organisational support. This multidimensional model was then applied to a transnational computing program, to assess the effectiveness of the program with respect to these dimensions, and determine if some of the individual aspects of the dimensions were more important to students than others.

EVALUATION

Three transnational computing programs, offered in Hong Kong by Australian universities in co-operation with Hong Kong partners, were selected for evaluation. Program 1, Bachelor of Business (Computer Systems Support) degree – BBCS, is offered by Australian university, University A, together with a Hong Kong partner institution, Partner A. The program commenced in 1997, and has produced over a hundred graduates to date. Program 2, Bachelor of Computer Science degree – BCO, is also offered by University A, but with a different Hong Kong partner, Partner B. This program has operated since 1992 and has graduated over two thousand students. The third program, Program 3, Bachelor of Information Technology degree – BIT, has been offered by a different university, University 3, in cooperation with the same Hong Kong partner as Program 2 (Partner B). Program 3 commenced in 1999 and has graduated nearly four hundred students to date.

All the evaluated programs operate in part-time mode for students who have previous approved tertiary qualifications. Students are normally in full-time employment, and usually study six subjects per year – two subjects per term. Lecturers from Australia are responsible for the design of curriculum, detailed teaching plans, continuous and final assessment, as well as face-to-face delivery of twenty five percent of the program. Part-time local lecturers, associated with the partner institutions, teach the remaining part of the program. The program relies on the Internet for communication, e.g. subject Web sites, bulletin boards, and email. Students meet with lecturers and fellow students through face-to-face sessions, and benefit from Web based support between sessions.

The purpose of the evaluation was twofold: to assess the extent of students' satisfaction with the multiple dimensions of their program, and to determine which aspects of these dimensions were perceived by students as most important to the effectiveness of the program. Data was collected through a survey administered to approximately three hundred students in the selected programs in July and August 2003. Two hundred and fifty nine completed surveys were returned, with the following breakdown of completed survey numbers across the programs:

Program1 (BBCS – University A, Partner A) – 53

Program2 (BCO – University A, Partner B) – 161

Program3 (BIT – University B, Partner B) – 45

Satisfaction with the Current Programs

The first part of the survey used a five point Likert scale (1=very poor, 2=poor, 3=average, 4=good, 5=very good) to measure students' satisfaction with three broad dimensions of the course:

Instruction/Instructor, Technology, and Course Management and Coordination. In the Instruction/Instructor dimension, several characteristics were duplicated to distinguish between University and Hong Kong instructors.

Students in Program 1 were satisfied with most aspects of the Instruction/Instructor dimension, whereby three aspects recorded highest level of satisfaction: instructors' communication skills, Hong Kong instructors' organisation and preparation for classes, and Hong Kong instructors' dedication to students and teaching. Students in Program 2 were most satisfied with University instructors' teaching ability, their organisation and preparation for classes, and their overall performance. Students in Program 3 were most satisfied with the extent to which lecture presentations relied on electronic media

and the overall performance of University instructors. Students in all three programs were least satisfied with the time taken by the instructors to mark and return written assignments and tests.

Differences between student satisfaction with various aspects of the University and Hong Kong instructors were also measured. Students in Program 1 were more satisfied with the Hong Kong instructors with respect to all aspects; some of the differences were significant. Students in Program 2 and Program 3 were more satisfied with the University than with the Hong Kong instructors with the exception of one aspect – the telephone/email accessibility of the instructors outside class; students were more satisfied with the Hong Kong instructors, but the difference was not significant. A summary of results together with the results of the Wilcoxon test is presented in Table 1.

Table 1. Student satisfaction with University and Hong Kong instructors. (preferred instructors and significance of preference noted)

Aspect	Program 1	Program 2	Program 3
Organisation and preparation for classes.	Hong Kong, p=.021	University, p<.001	University, p=.029
Dedication to students and teaching.	Hong Kong, p=.037	University, p<.001	University, p=.090
Teaching ability.	Hong Kong, p=.051	University, p<.001	University, p=.019
Encouragement of class participation.	Hong Kong, p=.358	University, p=.002	University, p=.027
Telephone/email accessibility outside of classes.	Hong Kong, p=.007	Hong Kong, p=.645	Hong Kong, p=.366
Overall satisfaction.	Hong Kong, p=.235	University, p<.001	University, p=.007

Student satisfaction with the Technology dimension was also measured. In Program 1, the level of student satisfaction was similar across all characteristics of the dimension. While the ease of use of technology was regarded highest (54% of favourable – ‘good’ and ‘very good’ – versus 5% of unfavourable – ‘poor’ and ‘very poor’ – responses), the extent to which the course relied on the use of technology at home rated lowest (27% of favourable and 4% of unfavourable responses). Students in Program 2 were most satisfied with the fact that classes were not likely to be interrupted due to technical problems (26% of favourable responses, and less than 15% of negative responses). They reported lowest satisfaction with the quality of the provided technical support (only 11% of favourable responses and nearly 30% of negative ones). In Program 3, student satisfaction with the Technology characteristics was lowest than in the other two programs; large percentages of unfavourable responses, ranging from 24% to 40%, were recorded for all characteristics. Students were relatively most satisfied with the ease of use of technology, and the overall usefulness of the course Web sites. They were least satisfied with the quality of the provided technical support (nearly 40% of negative responses).

With respect to the Course Management and Coordination dimension, student satisfaction was highest in Program 1, followed by Program 2 and Program 3. In Program 1, students were most satisfied with the accessibility of administrative and technical staff, and in Program 2, they were most satisfied with the opportunity to evaluate the program. The overall level of satisfaction in Program 3 was very low, with accessibility of administrative and technical staff regarded relatively most satisfactory. Students in all three programs were least satisfied with the access to university library; in particular, the level of dissatisfaction among students in Program 3 was very high – 67% of respondents regarded it as ‘poor’ or ‘very poor’.

Critical Success Aspects

In addition to indicating their level of satisfaction with the existing programs, students rated aspects of the programs with respect to their influence on program effectiveness. Accordingly, in each dimension, students ranked only the top three of at least seven given aspects that they considered most important to the effectiveness of the program, where first indicated ‘most important’, second – ‘important’, and third – ‘somewhat important’; students left the remaining characteristics in the

dimension without a rank thus considering them not important. The rankings were then reverse-weighted to determine the overall importance of each aspect within a dimension. The following dimensions were rated: Student, University Instructor and Learning Environment, Hong Kong Instructor and Learning Environment, University Instructor – Technology and Organisation, Hong Kong Instructor – Technology and Organisation, Curriculum and Instruction Design, Interaction, Evaluation and Assessment, Technology, and Course Management and Organisational Support. In each of the programs, three aspects ranked highest in each dimension were used for comparative analysis between the programs. Table 2 presents a summary of this analysis; in each dimension, only aspects ranked among the highest three by at least two programs are listed.

Table 2. Students' Perceptions of Critical Success Aspects.
(listed are only aspects selected as most important by students in at least two programs)

Dimension	Aspect	Program
Student	Is motivated and self-disciplined.	1,2,3
	Has positive attitude towards technology-based learning.	1,2,3
University Instructor and Learning Environment	Understands course requirements, students' characteristics and needs.	1,2,3
	Uses effective communication skills.	2,3
	Encourages communication between students, and students and instructors.	2,3
Hong Kong Instructor and Learning Environment	Understands course requirements, students' characteristics and needs.	1,2,3
	Uses effective communication skills.	1,2,3
	Encourages communication between students, and students and instructors.	1,2,3
University Instructor – Technology and Organisation	Is well prepared and organised.	1,2,3
	Provides well designed syllabus and presentation outlines.	1,2,3
	Has experience with technology-based courses.	2,3
Hong Kong Instructor – Technology and Organisation	Is well prepared and organised.	1,2,3
	Has experience with technology-based courses.	1,2,3
	Provides well designed syllabus and presentation outlines.	2,3
Curriculum and Instruction Design	Is relevant to job/career.	1,2,3
	Course objectives and learning outcomes are clearly communicated.	2,3
	Relates the new material to previous student knowledge.	1,3

	Integrates all course elements into a well-paced package.	1,2
Interaction	Timely feedback on assignments and projects.	1,2,3
	Use of interactive instructional strategies.	1,2,3
	Strategies that encourage communication between students, and students and instructors.	1,2,3
Evaluation and Assessment	Methods of assessment match learning objectives.	1,2,3
	Assessment of the relevance of course content in practice.	1,2,3
	Assessment of students' attitudes and levels of satisfaction.	1,2,3
Technology	Is helpful and easy to use.	1,2,3
	Is available and reliable.	1,2,3
	Current products are used.	1,2
Course Management and Organisational Support	Timely preparation of course materials.	1,2,3
	Institution ensures high quality of the course.	1,2
	Student support services are provided.	2,3
	Procedures exist to quickly respond to student complaints.	1,2,3

While there were differences in the ordering of the three most important aspects in each dimension between the evaluated programs, there was a considerable overlap of the aspects nominated as most important between the programs. In each of the dimensions, students in all three programs selected at least one common aspect as important. The degree of overlap was greater in several dimensions, with the highest consensus noted for dimensions Hong Kong Instructor and Learning Environment, Interaction, and Evaluation and Assessment; in those dimensions, students in all three programs selected the same three aspects as most important.

Student motivation and self-discipline was considered as the most important characteristic of the Student dimension by a majority of respondents in all three programs; over 70% of students in Program 1, 64% of students in Program 2, and 56% of students in Program 3 considered these attributes of students in transnational programs as factors contributing to the programs' quality. Positive attitude towards technology-based learning was perceived as a second most important factor.

Students in all programs nominated the same critical aspects for the two dimensions pertaining to Instructor and Learning Environment (University instructor and Hong Kong instructor alike): appreciation of course requirements and students' needs, effective communication skills, and encouragement of communication between students, and students and instructors. These instructor characteristics were perceived as the most influential to the effectiveness of the program with respect

to all instructors regardless of their affiliation and location. Similarly, students in all three programs regarded preparedness and organisation, experience with technology-based courses, and provision of well-designed syllabus as critical aspects of the two Instructor and Technology and Organisation dimensions – again, there was no distinction between University and Hong Kong instructors in terms of students’ perceptions of important characteristics.

In the Curriculum and Instruction Design dimension students in all three programs declared the relevance to job and career as the characteristic of greatest influence on the effectiveness of transnational computing programs. In all three programs, this characteristic was ranked highest overall and in terms of the percentage of first choices – 33%, 34%, and 27% respectively. This high ranking is also supported by literature related to mature students (Merriam and Brockett 1997; Miller and Stewart 1999). The importance of the practical application of the programs was further confirmed by the high ranking of the ‘relevance of course content in practice’ in the Evaluation and Assessment dimension.

With respect to the Interaction dimension, timely feedback on assignments and projects rated highest in all three programs, receiving the highest percentage of first choices in all programs (29%, 37%, and 44% respectively). It was a significant finding as, while students considered timely feedback essential to an effective program, this was an aspect with which they were least satisfied in their current programs.

One characteristic was singled out by students in all three programs as most important in the Technology dimension – ‘is helpful and easy to use’. Over 70% of students in each of the programs rated it as important, with the percentage of first ranks at around 30% in each program. Availability and reliability of technology, as well as application of current products was also considered important.

While timely preparation of course materials was considered important by students in all programs, students in Program 3 regarded it as the most important aspect of the Course Management and Organisational Support dimension. Conversely, although students in all programs regarded the institution’s responsibility to ensure high quality of the program as important, students in Program 1 and Program 2 considered this particular characteristic by far the most influential to the perceived effectiveness of the program.

Effectiveness of the Current Programs

In addition to evaluating students’ satisfaction with the current programs, and their perceptions of critical success aspects of transnational programs, students’ views on the effectiveness of the current programs were also recorded. Students indicated if they considered the current programs effective, if they would participate in this type of program (that is, mixed-mode transnational) in the future, and if they would prefer the program to be offered fully online. A summary of results is presented in Table 3.

Table 3. Perceived effectiveness of current programs – percentage of students.

	Program 1		Program 2		Program 3	
	Yes	No	Yes	No	Yes	No
Is the current program effective?	85	15	78	22	49	51
Would you participate in this type of program in the future?	69	31	47	53	47	53
Would you prefer the program to be offered fully online?	0	100	9	91	13	87

The majority of students in Program 1 and Program 2 regarded their programs as effective. Program structure and flexibility, and relevance to job/career were named as factors determining program effectiveness. However, short program duration leading to a formal qualification, competitive fees,

and generous exemptions for prior learning defined program effectiveness for most students. The approving assessment of the effectiveness of current programs did not correspond to the students' willingness to participate in a similar type of program in the future, with more than half of the students in Program 2 deciding against. Students cited disappointment with poor service offered by the Hong Kong partner institution, and poor teaching skills of Hong Kong instructors as a reason for not trusting similar types of programs in the future. Students in Program 3 were most critical about the effectiveness of the program – more than half of them did not find it effective; likewise, more than half of them did not wish to participate in this type of program in the future. Bad administrative service, poor feedback and support, and emphasis on self-study reduced the program's effectiveness and, consequently, discouraged the students from considering this type of program in the future.

Regardless of their assessment of the effectiveness of the current programs, students did not support full online provision of the programs. The lack of support was pronounced and ranged from total rejection of online programs by students in Program 1, to a marginal support of 9 to 13 percent in Program 2 and Program 3 respectively. Students repeatedly stated the importance of face-to-face communication as the most important reason for preferring the current program model. Face to face communication was preferred as, according to the respondents, it offered instant feedback, afforded easier communication with fellow students and instructors, was better for resolving study problems, and gave better motivation to study. Some students were of the view that learning in front of the computer only was too 'cold' and too difficult, while others were of the opinion that Hong Kong people had traditional attitudes towards education and therefore face to face communication was more suitable for Hong Kong students. Respondents did, however, acknowledge the usefulness of the Internet as a means for provision of course material and communication with instructors and fellow students.

CONCLUSIONS

This paper aims to highlight the need for a holistic approach to distance education, which takes into consideration various dimensions of the distance education context, instead of focusing exclusively on technology. The dimensions, relevant particularly to transnational education, include student characteristics and practices, instructor characteristics and practices, curriculum and instruction design, interaction, evaluation and assessment, technological characteristics, and program management and organisational support. This selection of dimensions, together with their characteristics, was used to develop a model for effective transnational education.

The model was applied to three transnational computing programs for validation. The results of the validation supported the original premise that technology, represents but one dimension of the distance education context, and that other dimensions also contribute to the effectiveness of distance education programs. The results also showed that the transnational students, irrespective of the evaluated program, agreed on the aspects that they considered most important to the effectiveness of transnational programs. Among all the aspects across all the dimensions in all programs, three were singled out as the most influential of all: instructors' preparation for, and organisation of, classes; relevance of the program with respect to job/career; and, instructors' appreciation of program requirements, students' characteristics and needs.

While the evaluation of the multidimensional model confirmed the inclusion of all the characteristics in the existing dimensions (every characteristic was rated as at least 'somewhat important', albeit by very few respondents), it also identified other characteristics, currently not included in the model, that students considered critical to program effectiveness. These characteristics, which are yet to be assigned to the existing dimensions, or for which a new dimension needs to be developed, include program cost, duration, and extent of recognition for prior qualifications.

Further research is needed to confirm that the multiple dimensions of the model are not a collection of separate entities, but parts of an integrated system. The interactions between the dimensions and the

extent to which they impact on each other will have to be examined. This may assist distance education providers planning new programs, or considering changes to existing programs, in determining the impact of their decisions.

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Monkhouse, G., and Garnett, P. Edith Cowan University, Australia. *Partnerships, Precincts And Pathways: The Joondalup Learning Precinct.*

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ABSTRACT

The Joondalup Learning Precinct (JLP) is believed to be the only educational precinct in the world incorporating a University, a Vocational Education and Training College, and a Police Academy. Edith Cowan University, West Coast TAFE College, and the Western Australian Police Academy have been purposely co-located within the Precinct to facilitate potential synergies that can arise from collaboration between the three different types of educational providers. The JLP services the rapidly expanding northern metropolitan corridor of Perth, and provides a range of educational pathways between the three institutions, facilitates numerous co-operative activities between the partners, and engages with the business community in research and joint venture projects. The Joondalup City Council is committed to the learning precinct and works collaboratively with the partner institutions to provide improved educational opportunities to the broader local community.

Together, the three educational partners collaborate to: share facilities and services; undertake joint marketing and advertising; identify articulated academic pathways for students aimed at improving educational opportunities and encouraging life-long learning; and undertake joint special projects. Outcomes of the Precinct include: carefully designed academic pathways that are clearly identified for students; cross-institution teaching in appropriate courses; collaborative professional development including a Peer Mentoring Program; joint involvement in community engagement activities; shared library resources; a proposal to establish a joint Centre for Leadership Development; and a feasibility study of a shared Community Child Care Centre.

The benefits afforded to the broader community through the formation of the JLP are significant. There is clarity and transparency for students articulating from one educational institution to another; there are joint research activities between the partners and improved access for local community and industry organisations to research and educational expertise; and there are cost efficiencies resulting from the sharing of facilities and resources. Through ongoing collaboration, the JLP will continue to contribute significantly towards the development of the City of Joondalup as a learning city.

INTRODUCTION

This paper seeks to undertake a brief exploratory review, within the Australian context, of the challenges and benefits of collaboration and engagement between campus and community, and the recent changes that have occurred within policy to progress this agenda. In addition it provides case-study examples of Edith Cowan University's own attempts to influence life-long learning and community engagement through its involvement in the Joondalup Learning Precinct (JLP) and the benefits that the JLP seeks to provide to the local community.

The concept of 'learning cities/towns/communities' gained prominence at the 1992 Organisation for Economic Co-operation and Development Conference (OECD). It is a concept that continues to provide challenges to universities about how they interact with their local communities and how to incorporate the philosophy of engagement and life-long learning into core academic and business activities and processes. The concept of 'learning cities' embraces the philosophical view that social cohesion, regeneration, environmental awareness and economic development are closely related to the knowledge, skills and participation of each member of the local community, and that universities have a key leadership role to play in ensuring this cohesion and development occurs (OECD, 2001).

The case for collaboration between universities, TAFE and local communities, and the contribution that collaboration can make towards the development of learning cities was discussed by Sommerlad, Duke and McDonald (1998). Their report, *Universities and TAFE: Collaboration in the Emerging World of Universal Higher Education*, emphasised the need for cooperation, partnerships and strategic alliances between universities, vocational education, business and industry, and professional organisations, if communities are to recognise their full economic potential through combined efforts to develop learning cities (pp. xiv – xvi). Within Australia the need for higher education institutions to engage more at a local level and to provide greater leadership in contributing to a region’s economic development has been identified at a micro and individual institutional level. Unfortunately this is yet to occur at the broader macro level and engagement is yet to be fully embedded and embraced within academic practices across the nation. Nor have active efforts been made by universities and vocational education and training providers (VET) to provide collective leadership in integrating ‘life long learning’ strategies into the local community.

Garlic (2004) attributes this lack of integration and collaboration to two factors:

- policy funding arrangements within higher education and regional development are yet to recognise and support community engagement at a national level; and
- university leaders are yet to embrace community engagement as being a valuable investment strategy that can be used as effectively as internationalisation strategies, quality improvement, and business partnership building.

Within Australia there has been considerable political rhetoric aimed at encouraging greater collaboration between universities, TAFE, industry and their local communities. In 2002 a major review of the Australian higher education system was conducted which resulted in a major reform package being developed. A major theme of the Review was the call for more collaboration between higher education providers and other education providers, industry, business, regions and communities. The Reform Package includes the establishment of a Collaboration and Structural Reform Fund. Initial priorities will focus on collaboration:

- in course provision between higher education providers;
- between higher education and vocational education and training providers in course provision or areas related to teaching and learning;
- between higher education providers and their communities; and
- between higher education providers and business/industry/employers or professional associations.

These recent changes in higher education policy and attitude go some way towards encouraging further engagement between universities, other educational institutions and the local community. Unfortunately the branches of funding available to facilitate significant and ongoing engagement are quite small.

The recent changes within the Australian higher education sector are by no means a new phenomenon. The Sommerlad et al report (1998) predicted that collaboration between universities and TAFE would become almost a condition of a university’s survival in the early 21st century, and that “for most if not all their destiny [will be] embedded in the prospective ‘learning regions’ which each inhabits”. [This has meant] “universities and TAFE need to become even more flexible, adaptable, responsive, sharp, efficient, and competent at networking. They need to be more like tomorrow’s networked knowledge-based industries.”(pp. xiv-xvi).

The anticipated enhancement of collaboration between institutions has the potential to lead to increased rationalisation of resources and facilities, fostered through campus co-location and joint use of information technology and other infrastructure facilities. While attempts have been made at individual levels to integrate the use of resources between various universities and TAFE, this has proved difficult due to the different jurisdictions under which they operate, a lack of incentives, and different cultures operating within these institutions.

The Association of Commonwealth Universities (ACU) in their report 'Engagement as a Core Value for the University' (2001) also emphasised the need for engagement, suggesting that no longer was it sufficient for universities to stand apart from the community and other education providers. Wedgwood (2003), in supporting this view, considers that engagement should involve all sorts of fruitful interactions between the academic community and the wider society. She believes that "the exchange of thinking across the boundary between academy and the rest of society, between thinkers and practitioners, researchers and innovators-on-the-ground is essentially synergistic – it yields more than the sum of the thinking of both undertaken separately" (p. 126).

The development of seamless and transparent learning pathways that encourage the community to embrace life-long learning is an important outcome that should flow from an integrated higher education sector. Additional benefits that accrue to the community when the local university is fully engaged and providing leadership in the development of a 'learning city' culture can be significant. The Australian Department of Transport and Regional Services (DOTARS) recently released its report 'Community and Campus – The Benefits of Engagement' (2004), which cited (pp. 7-8) benefits of engagement that flow to the community as "knowledge transfer that can occur through the application of a university's teaching, research and scholarship can enhance every area of a regional community's long term development and economic sustainability". Active engagement offers support for the community to manage external pressures and to have control in determining their own future in addition to offering the community with access to a skilled workforce which can be used for technical, professional and research consultancy services, and through the recruitment of graduates or via student projects.

The DOTARS report also suggested that by focusing on the local community, the university itself can use engagement as an opportunity to identify local niche markets in which to apply its teaching, research and possible commercial efforts. This enables the university to differentiate itself from competitors and facilitates the development of partnerships with industry and community groups in order to place students in workplace projects.

The benefits that accrue to both 'town and gown' through collaborative efforts can also be significant from a cost efficiency perspective when engagement is undertaken particularly well. There are numerous examples within Australia and internationally where the sharing of infrastructure and resources has not only resulted in significant cost savings but has strongly influenced the cultural development of a community. Edith Cowan University through its partnership with the Joondalup Learning Precinct has been able to realise many of the benefits that can accrue to both the university and the broader community through improved collaborative efforts.

ESTABLISHMENT OF THE JOONDALUP LEARNING PRECINCT

The City of Joondalup, located 25 kilometres north of the Perth central business district (CBD), was established as part of the 'New Cities' evolution of the 1970s, which anticipated that the City of Joondalup would develop as an essentially self-sufficient satellite city to the City of Perth. Edith Cowan University (ECU), an already established higher education institution with three urban campuses close to the Perth CBD (and a fourth regional campus two hours south of Perth), established its fifth campus in Joondalup in 1982. Courses on the Joondalup campus officially commenced in 1984. The University demonstrated its commitment to engage with the local community and contribute towards the development of a 'learning city' early on, when in 1998 it partnered with West Coast TAFE college, a co-located campus, to establish the Joondalup Learning Precinct (JLP).

One of the first major initiatives of the alliance was to combine to lobby the West Australian Government to build the new West Australian Police Academy within the Precinct. This was a successful venture that has contributed significantly to the economic development of the region and paved the way for the first purpose-built police training facility in Australia. A new expanded alliance incorporating the West Australian Police Academy was officially established through the signing of a Memorandum of Understanding in 1999. Together the three partners, Edith Cowan University; West

Coast TAFE College, and the West Australian Police Academy combined to form the current Joondalup Learning Precinct. This alliance is believed to be the only educational precinct in the world that incorporates a university, a TAFE college, and a police academy.

Through the co-location of the three campuses, the alliance acknowledged the synergies that could be achieved, thereby contributing towards the creation of a 'learning city/community' in the region. The range of educational programs and pathways, training, human resources, physical resources and infrastructure offered by the JLP are considered to be some of the best within the State and possibly the nation.

Edith Cowan University itself had been forward thinking and quick to respond to changing priorities within the higher education sector. In 1997 the University Council made the strategic decision to focus the University's core academic activities (teaching, learning and research) on the provision of service to, and preparation for the professions, especially in the growing services sector including teaching, nursing, community services and policing. ECU is believed to be the first University in the world to have established an Institute for the Service Professions created specifically to provide research and education for the service professions sector.

The establishment of the JLP demonstrated the partners' commitment to act as leaders in contributing towards the regional, economic, and social development of the City of Joondalup as a 'learning city'. As suggested by Shoemaker et al. (2000, p.xx) "there may be no better way for education to reach out to communities...than by establishing joint ventures which can transform them from being unconnected and underperforming areas into vibrant centres of learning regions". Through the JLP, not only have the partners been able to collaboratively contribute towards the socio-economic development of the region but individually the three institutions have been able to differentiate themselves within the higher education sector by offering a unique range of pathways and facilities within the Precinct.

Whilst acknowledging that there are many benefits that have already accrued to the local community through the establishment of the JLP, the partnership is young and there is still much that needs to be done before it reaches its maximum potential. Goodwill has existed between the partners from the outset and proactive efforts have been made to anticipate the various obstacles and barriers that have been encountered in other multi-partner campuses, both nationally and internationally.

In 1999, the (then) Department of Education Training and Youth Affairs commissioned a report on multi-partner campuses/multi-campus partners within Australia. The report (Shoemaker et al. 2000, p. 156) identified a number of common barriers encountered by learning precincts that included:

- jurisdictional incompatibility between the higher education and VET sectors, particularly with respect to industrial relations issues;
- differences in academic calendars between VET colleges and universities;
- perceived status differences between university and VET academic staff;
- different approaches to teaching and assessment that cause difficulty for articulation across the sectors;
- different state and federal funding models, including submission timetables and processes, that reduce the opportunities for joint initiatives;
- concerns about cross sector (and cross government) subsidisation;
- failure to identify innovative mechanisms for sharing ongoing costs once an initiative has been implemented;
- different administrative and reporting approaches that make shared functions problematical; and
- potential competition between partners that may result in a lack of willingness to share information and ideas.

To pre-empt and address many of the barriers confronted by other educational precincts, the JLP sought to establish a framework for the partnership that would minimise the influence of these barriers. The framework included:

- The establishment of a strategically selected Board of Management that includes senior executive representatives from each institution to ensure there is ‘top-level’ support for the partnership. The Board also includes senior representatives from the local City Council as ex-officio members. The Board meets every six weeks to identify opportunities and monitor the progress of established projects.
- Each institution committed resources to employ an Alliance Liaison Officer. The Alliance Liaison Officers work closely with each other to facilitate the development of initiatives and to identify projects that would be of strategic benefit to the JLP partnership.
- The establishment of a collaborative fund. The JLP budget is managed through the University but contributed to equally by each of the partners and is available to seed potential collaborative projects between the partners. This specially allocated budget provides incentives for staff to initiate projects and overcomes barriers that may have arisen if each project had to seek special funding from the separate institutions.
- The establishment of working parties which have responsibility to meet on a regular basis to identify and progress opportunities in the core areas of collaborative marketing, and resource and facilities sharing. Other working parties are established as projects arise and remain in place for the duration of the project.
- The establishment of reporting mechanisms to the Board to ensure the successful implementation of projects and development of collaborative partnerships.

Anticipated outcomes from the partnership are specified in a Memorandum of Understanding prominently displayed within each institution to ensure maximum internal exposure and promotion of the alliance and its objectives. On an annual basis the JLP Board reviews the MOU, develops an annual report, and prepares an operational plan for the following year. The annual review of these documents provides an opportunity to reflect and to ensure that the objectives specified in the MOU continue to meet the needs of each of the partners. Key performance indicators to measure the actual success of the partnership are yet to be developed but will be investigated in the near future.

OUTCOMES

Articulation Pathways and Collaboration in Course Development and Teaching

Normal articulation

West Coast TAFE college and the University have developed a number of academic articulation pathways that permit students to apply for entry and credit into higher education awards. Pathways are marketed to future and existing students in a JLP Pathways brochure which is reviewed on an annual basis. This ensures that each institution remains abreast of each other’s courses and the partnership remains proactive in identifying opportunities to develop additional pathways.

The WA Police Academy is a Registered Training Organisation that awards a Diploma in Public Safety to recruits who successfully complete the two-year police training and probation period. Following successful attainment of this award, police officers may articulate into an Advanced Diploma at TAFE or an undergraduate award at University.

Special pilot projects to enhance articulation opportunities

Following the allocation by the Department of Education, Science and Training (DEST) of additional funded places in the Bachelor of Nursing, the University has reserved a quota of places specifically for West Coast TAFE College students who successfully complete the Certificate IV in Enrolled Nursing.

The pilot program requires the TAFE graduates to attend an intensive University Transition Course (UTC) prior to enrolment at ECU. The UTC has been collaboratively developed by the University and TAFE and seeks to enhance the students' research and writing skills prior to commencing university study. The performance of the students who participate in this pilot project will be evaluated over the next two years. This pilot program has also been extended to include a small number of TAFE students graduating with a Certificate IV in Fitness who will articulate into the Bachelor of Science (Sports Science).

Course developments to foster articulation

In addition to the standard articulation pathways that permit students to apply for credit into a higher education award, there are a number of 'special' pathways that have been negotiated between the partners. The University and West Coast TAFE college have collaborated to develop a new entry and exit point for TAFE students graduating with a Diploma or Advanced Diploma in Hospitality and/or Tourism. The University has developed new Associate Degrees in Hospitality and Tourism that can be accessed by West Coast TAFE graduates, in addition to the full three year Bachelor degree.

The University has collaborated with the WA Police Academy to develop an Associate Degree in Social Studies (Policing) and a Bachelor of Social Science (Policing). Both courses provide articulation opportunities for graduates of the Academy. As well, the University and the Academy share teaching resources. Experienced Academy staff may teach some components of relevant degree programs such as security, risk and police studies, and University staff may undertake guest lectures to police recruits. Both institutions also share teaching facilities such as the Academy's mock courtroom and scenario crime village that have been purpose built for police training.

End on course developments

The University and TAFE college have collaborated to develop a Bachelor of Science (Network Technology) that has been specifically designed for graduates of the TAFE Diploma in Information Technology (Network Engineering). TAFE graduates with a Diploma in Information Technology (Network Engineering) will have the opportunity of articulating directly into a two year top-up course leading to a Bachelor of Science (Network Technology). This arrangement is beneficial to both institutions. The TAFE college already teaches the Diploma in Information Technology (Network Engineering), a course involving expensive technology, and they are now able to offer an additional pathway for students to articulate into at University. The University has been able to establish a new degree at limited costs.

Staff from ECU and the WA Police Academy recently collaborated to develop a course proposal for an undergraduate award in Public Advocacy. The course will not only establish a unique educational pathway for police prosecutors to articulate into the Bachelor of Law, but will also offer professional qualifications for a diverse range of practitioners who are required to prosecute offenders before the courts. The course will be relevant for staff working within fisheries, agriculture, child protection, liquor and licensing, and the police service.

Integrated course developments

The University has collaborated with the WA Police Academy to develop a customised Officers Development Course (ODC). Teaching for the ODC is shared between the two institutions, as the Academy teaches two operational units and the University teaches two theoretical units. Students who successfully complete the course are eligible to receive credit for two units into the Graduate Certificate in Management. The three JLP partners are also embarking upon an extensive mapping exercise to assess additional credit that may be given in recognition of the extensive professional development undertaken by police during the course of their career.

Edith Cowan University collaborates with TAFE in the teaching of a small number of ECU undergraduate awards that incorporate some VET units. For example, in the Bachelor of Social Science with a major in Children and Family Studies, students undertake four TAFE units that are an integral component of the course. In addition, ECU is considering the transfer of two units in its

Bachelor of Hospitality and Tourism Management that relate specifically to food and beverage handling to West Coast TAFE college, which is better equipped to provide this teaching.

Recently the JLP partners have collaborated with industry representatives working within risk management to develop a Graduate Certificate in Risk Management. This was an identified gap in the local higher education sector and by working collaboratively with industry and its JLP partners, the University has been able to:

- plan a course that offers a suitable industry qualification;
- provides formalised networking opportunities for participants;
- access a range of industry contacts and practitioners to teach in the programme; and
- design a course that meets the professional development requirements of the internal staff who work in risk management for the JLP partners.

Research and Development Contributions to the Community

The combined efforts of the JLP partnership provide the local and broader community with access to enhanced research and development capabilities. The JLP, mainly through the University, has provided leadership within the local community through its involvement in:

- partnering with the City of Joondalup to establish a Business Incubator which supports the establishment of small businesses in the region and provides ongoing training and support for business operators housed within the Incubator;
- establishing the Fogarty Centre which provides professional development for teachers and undergraduates in the teaching of literacy and numeracy; and
- a project co-ordinated through the West Australian Department of Education and Training that has undertaken an extensive analysis of education trends within the north-west metropolitan corridor of Perth for youth aged 15-19 years. This research has highlighted that there are significant educational trends in the region that will influence future strategies for providing life-long learning.

Since 2002 the Institute for Service Professions at ECU has been working with representatives from the State's policing, nursing and teaching professions to conduct research into the wellbeing of staff working within these professions. The project has involved collaboration with representatives from employers, unions, professional associations and agencies to develop an index of wellbeing across the three professions of nursing, policing and teaching. The concept of wellbeing encompasses a broad range of issues such as stress, organisational commitment and job image. The index is intended to serve as 'an efficient and reliable way to monitor and benchmark the 'health' of these professions; to evaluate the effect of initiatives and policies; and to highlight comparisons between professions that can inform strategy development' (Institute for the Service Professions, 2004). The project has recently been awarded a prestigious Australian Research Council grant with the intention that the findings will inform the State's decision making practices relating to the wellbeing of staff working within the three professions.

The Institute is also involved in a collaborative project "Building and sustaining core public services in regional Western Australia" with the Institute for Regional Development (University of Western Australia). The project is "investigating trends and issues associated with the attraction and retention of people in regional, rural, and remote Western Australia" (Institute for the Service Professions, 2004). This project is again focused upon the professions of teaching, nursing and policing, in addition to human service workers, and aims to develop strategies to improve the retention and attraction rates of these professions working within regional Western Australia. The research is being conducted in partnership with, the Department of Local Government and Regional Development, Regional Policy Unit within the Department of the Premier and Cabinet, Police Service, Department for Community Development, Department of Justice, Health Department, Department of Education and Training, Department of Indigenous Affairs, and the Disability Services Commission.

COLLABORATIVE PROJECTS

In addition to cooperation in some of their core business activities, the JLP partners also collaborate on a range of other projects that are to their mutual benefit. Some examples are set out below.

Leadership Centre

The JLP partners have been collaborating to develop a unique Leadership Centre that will meet the professional development needs of senior middle management working within the service professions sector. The proposed courses within the Centre will be specifically designed to meet the needs of staff who work within the service industries and professions. These courses will address professional development needs for senior staff within the JLP institutions and will also enable participants to receive credit into a Graduate Certificate in Business (Management). The Centre will be operational in 2005. This is the JLP's first attempt to develop a collaborative commercialised venture.

Childcare Facilities

The rapid expansion of the ECU Joondalup Campus has presented an opportunity for the partners to collaborate on their first major structural project, the development of a shared childcare facility. The partners have invited the City of Joondalup and the local Health Campus to participate in the development of a facility which will not only address student/staff childcare needs, but will also be a state-of-the-art collaborative teaching and research facility for West Coast TAFE college and the University. Consultants have been engaged by the JLP Board to facilitate the progress of this new development and input is being sought to address issues relating to size, design and ongoing maintenance and management of the facility.

Peer Mentoring

The three JLP institutions have recently launched a pilot Peer Mentoring program. The pilot program involves staff from the three institutions sharing knowledge and enriching each others skill levels through a share-and-learn program. The program is also designed to further promote the JLP partnership to internal staff and develop collaborative relationships amongst staff.

Professional Development

Staff from each institution are able to attend professional development courses offered by partner institutions when vacancies are available. This provides an invaluable opportunity for networking and the sharing of diverse views and experiences between staff from the three institutions.

SHARED RESOURCES AND FACILITIES

The JLP partners work closely with one another to identify opportunities for the joint use of resources and facilities. This can clearly be to the advantage of all institutions as well as improving the efficient use of public resources.

Facilities

Senior managers from the JLP's Facilities and Services departments meet on a regular basis (together with a representative from the City of Joondalup as required) to share information on future planning projects and to identify opportunities for synergy. The JLP has sought to expand arrangements for sharing facilities and services, but this is an area where many of the barriers highlighted by Shoemaker et al. (2000) do exist. These barriers relate particularly to differences in institutions' financial independence and decision-making capabilities, variations in tendering processes (which are often dictated by legislation at a state or federal level), and differences in timing when institutions review existing 'supplier' contracts.

Despite these inhibitors and the short history of the alliance, the JLP has demonstrated some significant achievements. These include the shared use of facilities and venues such as the University's gymnasium, teaching facilities and collaboration in the operation of a part-time community Family Day Care Centre.

Signage

The JLP has its own brand logo that is used for promotional and marketing purposes. By early 2005 the JLP logo will be prominently displayed on signage within the Precinct to promote the JLP as visitors enter into the Precinct triangle.

Transport

The precinct is a 10 minutes walk from the centre of Joondalup and the main public transport hub. The local City Council has collaborated with the JLP partners and local business and industry to lobby the State Government to provide a transit bus for the region, the same as is available in metropolitan Perth. The bus is specifically designed for people with disabilities and facilitates the transport of students, staff and visitors entering the Precinct. Similarly, it will facilitate visits by staff and students into the City of Joondalup thereby contributing to the economic growth of small business in the city.

Services

The University provides bulk photocopying services to West Coast TAFE college on a cost recovery basis. The three partners also have a Memorandum of Understanding that permits students and staff to access each other's library facilities.

Marketing

The JLP promotes itself through collaborative marketing and joint sponsorship in local community events such as the Joondalup Festival, the ECU Careers Expo and the Police Academy open day, at which all three institutions are represented.

The partners advertise collaboratively in the local Community Guide and in 2005 will be undertaking joint-marketing in the local Community News which is a weekly publication read by a high percentage of the local community.

The partners, together with the City of Joondalup, are represented on a JLP Marketing Working Party which meets on a six weekly basis to share information on future events and to identify collaborative opportunities that will support the ongoing development of the region.

INTEGRATING THE JOONDALUP LEARNING PRECINCT INTO THE WIDER COMMUNITY

Community engagement is a driving force for each of the JLP institutions and the City of Joondalup's City Council. In mid 2004 the JLP partners collaborated with the Council to invite Professor Rick Battistoni, an international expert in Community Engagement and Service Learning from the United States, to conduct a series of seminars for the community and JLP staff.

To expand upon the benefits gained from this visit, a Community Forum is being co-hosted by the City of Joondalup and JLP partners in early 2005. The theme for the Forum is "Linking Thinking Communities – self directed learning in the digital age". The focus will be on emergent technologies within a learning context, and providing participants with the opportunity to 'work-shop' how the community can access and use this technology to promote community participation and engagement. The Forum will also provide an opportunity for the City Council and the JLP partners to demonstrate leadership in developing the local community's future communication and participation strategies within a learning context.

To support engagement and the pursuit of life-long learning within the community, the JLP is collaborating with the City of Joondalup to establish a unit that will facilitate the development of partnerships and capacity building between community organisations, industry, business, and the JLP partners with local community.

CONCLUSION

Whilst acknowledging the JLP has operated in its current format for a short period of time and there is still much to be done, the partners are proud of the achievements that have been made to date. In early 2004 each institution reinforced their commitment to the partnership by signing a new Memorandum of Understanding that sought agreement on the alliance's future directions. Increased efforts have already been made to improve student access to shared qualifications and articulation pathways; several collaborative projects have commenced which will be closely monitored to ensure successful outcomes; an extensive operational marketing plan for 2005 has been endorsed by the Board; and programs have been developed which will continue to promote the development of relationships amongst staff across the three institutions. The Joondalup Learning Precinct represents a successful model for collaboration between different types of educational providers and is becoming a major driver of community capacity building within the City of Joondalup

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In a world increasingly becoming multi-cultural, the assessment of competency in a given society's higher education institutions is open to the criticism that they are little more than tools for perpetuating the dominant hegemony. This paper challenges accepted notions about the role of assessment in student learning and examines the usefulness of a combination of self, peer and institutional assessment (multi-modal) for accommodating a multiplicity of perspectives within the learning environment. It outlines the advantages and disadvantages of three assessment processes and argues that cultural and social difference can be ameliorated through a combination of all three processes. While the suggested approach does not apply to all learning contexts, it is particularly beneficial for evaluating group work and practicals where there is already an environment of multiple perspectives. The multi-modal approach to evaluation accords equality to and allows the accommodation of divergent cultural 'voices'. In addition, a desirable outcome of this approach is the creation of a learning environment conducive to deep learning through the reduction of performance anxiety which is often high in cross-cultural contexts.

Australia has a social structure consisting of many diverse cultural groupings but it cannot be truly multi-cultural until such times as systems are in place that can accord equality to the voices of the non-dominant. This paper argues that evaluation processes do not occur free of societal and cultural context. Where this discounts or ignores cultural differences it will inevitably result in hegemonic oppression and the marginalisation of those who are disaffected. Despite a multiplicity of diverse cultural and social groupings in Australia the viewpoints of the disaffected cannot be accorded equality as they must contend with evaluation practices that reinforce Western hegemony. Australia, like all Western countries, discounts the views of others when they do not accord with the dominant predisposition or taxonomies (Morgan, 2003). The perpetuation of the dominant hegemony, despite inherent inconsistencies, engenders resentment, non-cooperation, non-disclosure or gratuitous compliance from disaffected social groups such as Indigenous Australians and is reflected in educational outcomes. Until evaluation processes can engender ownership in those it is intended to assist, social justice obligations in higher education will remain unmet.

Learning/Evaluation Contexts: A cultural product

Evaluation of performance is a necessary evil. The higher education institution, the student and other end-users of tertiary education services need norms against which to measure standards of excellence, improvements in performance and as a benchmark of skills and abilities attained in a given area of knowledge (Airasian, 1994; Angelo & Cross, 1993). However, there are issues regarding how accurately the learning environment and the methods used to assess this reflect the environment into which the skills and knowledge learned is applied. There is little doubt that assessment processes are stressful upon those being assessed and that this affects outcomes on performance measures. Assessment, none the less, is necessary despite shortcomings about its applicability to the 'real world'. The performances of students (and educators) need acknowledgment and end users need reliable indicators of their ability (Cartwright, 1997).

The process of evaluation is not context free and methods of evaluation are hotly contested. Those who control the implementation of learning programs will invariably dictate the evaluation process. In Australia, which is sparsely populated and separated by vast distances, frequently these processes are controlled by policy makers and education bureaucrats located at distant regional centres or in state capital cities. While the development and implementation of educational programs, services and research are responsive to national and state policy frameworks (and often political agendas) those who control these processes often have little local knowledge of the context into which those educated

by these processes will apply their skills and knowledge. In this environment, specific local factors can be deemed irrelevant. Though hotly debated, it can be argued that the further away a program is developed from its site of implementation the greater the inappropriateness of the outcomes to local application. The development of educational programs, services and research by centralised bureaucracies, marginalises local expertise, ignores specific local factors and needs and agendas. Nor do these programs necessarily recognise that which may be highly valued by educational consumers. Despite an educational bureaucracy that is more reflective of the diversity of Australian society, both culturally and socio-economically, educational programs may not be more attenuated to local constraints. It is a sad reality that those who have achieved positions with the authority to implement educational programs, services and research are often reliant upon experience and theory which can be more than twenty years out of date. This is further compounded by the homogeneity that exists within many bureaucracies that creates a gulf between the educational program development environment and the context of its delivery.

Without an educational evaluation environment that is more reflective of situational contexts the results, whatever their intention, will be students who are less prepared for the 'real world'. The society that these students will contribute to and shape will be little more than a reproduction of structures of hegemonic oppression that continues the marginalisation of disaffected social groups. The views of the dominant, the powerful, will prevail over the dominated, the powerless. Australia has an increasingly diverse society with a multiplicity of cultural and (sadly) socio-economic social groupings which need to have their interests represented in decision and evaluation processes, particularly in relation to educational programs and research which affect them. Not to find ways to incorporate the views of these people within evaluation frameworks is a contradiction of the principles of social justice which underpin Australian's conceptions of themselves. While the voices of the disaffected are excluded from evaluation processes, principles of fairness, inclusion, recognition and social support cannot be adhered to.

In Australia, as with most Western countries, evaluation practices are reductionist and reflective of Western hegemonic cultural approaches and assumptions. These practices are unable to recognise and accommodate multiple perspectives (ontologies) and are sceptical of unfamiliar epistemologies – seeking to resolve 'dissonance' in favour of concrete certainties (Morgan, 2003). For those inculcated within these belief systems this has an intuitive feel of rightness. On the surface it seems illogical to acknowledge the validity of views which are counter to one's own (it in fact results in a paradox which must be resolved to avoid cognitive dissonance). Reason dictates that if one's views are correct then they should prevail and if they are not then they should change to accommodate the correct view (Morgan, 2003; Morgan and Slade, 2000). There is little space in Western thought for a diversity of different views and even less place for them in higher education where educationalists want the most correct views taught so that their students base decisions in application upon certainty. However, if alternative views cannot be represented in the evaluation processes past hegemony will be perpetuated, existing social inequalities will become entrenched and the move to achieve social justice will be little more than rhetoric.

Cultural assumptions can be inconsistent, but the inconsistency of views should not be a basis for discounting the views of others despite the potential for dissonance. Western thinking involves many such inconsistencies that result in logical paradoxes that remain unresolved (Morgan, 2003). Within the dominant culture little need is seen to resolve the dichotomies that exist between religion and science or that which exists between the sexes. But it is often raised as an issue when the dominant culture interacts and finds inconsistencies exist between and within various subsections of another culture. Where these inconsistencies are identified in a disaffected group they are cited as concrete reasons for ignoring cultural differences and implementing evaluation practices which are not reflective, ignore cultural taboos and are culturally insensitive. The hypocrisy that results from the accommodation of inconsistencies within the dominant culture while insisting consistency from disaffected cultural groups engenders an environment of resentment, non cooperation, non-disclosure or gratuitous compliance from those affected (though this is often unrecognised by members of the dominant culture). The evaluation of programs, services or research conducted in this environment is

predisposed to distorted and inaccurate evaluation outcomes. Thus in cross-cultural situations the effectiveness of evaluation is often undermined.

Learning Outcomes: A Result of Evaluation Practice

In higher education environments the learning that occurs is purposeful and situated within a particular context, and rightly so however, if the evaluation process overly influences learning outcome it is of questionable value. Many educationalists structure their course work to reflect, as closely as possible, the social and working environment where their students will apply the skills and expertise gained in the classroom. However, the learning context and assessment methods impact upon the types of learning that occurs. This can be countered by the evaluation methods used. Undesirable surface learning often results from heavy workloads, prescriptive course materials, lack of choice within the topic, lack of choice in study methods, high topic contact hours and assessment systems that provoke anxiety. The learning process in these situations is often perceived to be external to the learner and in extreme cases as an imposition of the educational institution. In contrast, deep learning is desirable as it encourages the learner to understand the application of knowledge and expertise to the 'real world' (Gibbs cited in Cartwright, 1997). It is fostered by the systematic involvement of the student in choice of topic content, allowing them to make connections with past learning, to plan their learning, reflect on the process and make abstract connections (Gibbs cited in Cartwright, 1997). The use of practicum's, group work and field work allows the development of skills and expertise that reflect the social and working environment. While these methods are beneficial they do not address criticisms of cultural bias in evaluation nor do they necessarily allow the incorporation of non-dominant cultural voices in the evaluation process

The nature, structure and the context of educational delivery in higher education presents a number of barriers to achieving desirable learning outcomes or promoting deep learning. Many of the students faced by educationalists are undertaking studies because it is a prerequisite of their course structure and therefore they are less committed to achieving topic aims. Some students fail to understand the relevance or to make the connection between course material and the context of its application. Gibbs (cited in Cartwright, 1997) found that forced compliance and/or a threatening anxiety provoking assessment systems promote surface learning. And while practicums, group work and field work can overcome some of these issues, many students find assessment presentations threatening (Gibbs cited in Cartwright, 1997). The resultant anxiety is counterproductive to producing deep learning and less reflective of 'real world' situations.

Where evaluation is applied in cross-cultural contexts or there is a diversity of cultural viewpoints within the learning environment the potential for students to resort to surface learning methods is increased. Unfamiliar contexts produce anxiety and students may have concerns that the tools used to evaluate their performance are subjective (Airasian, 1994; Angelo & Cross, 1993; Cartwright, 1997). Students are both vulnerable to, and active in, the assessment process and may respond in these contexts by simply establishing what their assessors require from them for a passing grade and work towards that rather than actively engaging in the topic. The cognitive dissonance produced by cross-cultural contexts may also be reduced by more prescriptive applications of the students own cultural predisposition. Perceptions of subjectivity, cultural bias or cognitive dissonance in evaluation or assessment are counterproductive to deep learning and applicability and the relevance of learning to the 'real world' (Cartwright, 1997).

Learning Outcomes: An evaluation of assessment practices

The challenge for assessors is to create assessment environments and methods that more effectively evaluate and rewards the type of learning (deep learning) that can be applied in the 'real world'. The following outlines the advantages and disadvantages of three types of assessment as they apply to group work, cross-cultural field work and practicums:

Single Source Assessment

All educationalists are familiar with and have experience with single source assessment. Many who implement these forms of evaluation are aware that they are open to claims of subjectivity in their

grading. And while this form of assessment can promote surface learning rather than deep learning, the marking criteria used can act as a mediating factor (Airasian, 1994; Angelo & Cross, 1993). However, group work, cross-cultural field work and practicum's, where the assessment criteria are more flexible offers no such mediation. Educationalists are presented with a context where there is the potential that, rather than deeply engaging in the topic, students may seek to reduce the anxiety bred of uncertainty by adopting prescriptive approaches to learning. They may do this by establishing their assessor's theoretical position in relation to their practicum subject and then support that position. Thus they reflect their assessor's predispositions to increase their chances of achieving a good grade. Such reproduction may be self-affirming for the assessor but it is not conducive to student deep learning and it may not be reflective of the skills and abilities required for 'real world' application. While some would argue that this type of behaviour is encouraged and rewarded in the working environment such positions would allow little space to engage and incorporate a diversity of viewpoints. And while educationalists can overcome this particular objection through ensuring that assessors are careful not expressing their views or predispositions on topic matters, this does not produce positive learning experiences for students. The lack of perceived engagement with students by educators does little to reduce their anxiety in an unfamiliar learning context (Cartwright, 1997).

In using single source assessment the educationalist is 'caught between a rock and a hard place'. Perceptions of subjectivity in grading can be overcome by implementing more objective forms of assessment such as concrete transparent marking criterion for group work, cross-cultural field work and practicum's. However, if this criterion is too prescriptive there is the possibility that students will use it as a checklist for their work. This presents the dilemma of the need to constrain the learning context to allow this form of evaluation and running foul of the criticism that the constrained environment is less reflective of the 'real world'. While it may address the problem of perceived subjectivity of the assessor, if group work, cross-cultural field work and practicum's are to promote deep learning in students then this approach may defeat its stated purpose. And if learning context is less constrained and assessment is more flexible then the potential for subjectivity in evaluation is increased with attendant potential to promote undesirable surface learning.

Self Assessment

Perceptions of subjectivity and bias from assessors can be resolved by removing them from their central positions in evaluation. Self grading can involve prescriptive assessment criteria, against which the student evaluates performance however, this can impede deep learning as the student may adopt an instrumental approach and respond to the criteria rather than engaging in the learning process (Cartwright, 1997; Staniforth, 1997). Thus it will be less effective for promoting deep learning for the reasons outlined above. More effective is the process whereby the student is involved in the process of developing the criteria against which to measure their performances in group work, cross-cultural field work and practicums. Self assessment assumes that students can take responsibility for setting and judging the standard of their work. It has advantages in promoting deep learning as students can relate their experiences to and of the 'real world' and tailor their learning accordingly. Boud (in Cartwright, 1997) contends that self assessment is a necessary skill required of all students and that it is the foundation of effective learning which makes a significant contribution to a student's professional work after graduation. The process of self assessment can encourage self reflection and help students to develop "...appropriate standards of performance (self-developed criteria) and to apply them to their own work." (Staniforth, 1997:30). Thus self assessment can be a positive influence in promoting deep learning.

Despite some advantages in promoting an environment that can support deep learning, self assessment is not without problems. Among these is that students may adopt an instrumental approach to learning where they seek to satisfy what they perceive to be the requirement of the educators rather than engage more deeply in learning (Cartwright, 1997). If this is the response then self assessment will make no contribution in equipping students to engage in the 'real world'. Another problem noted by Brown and Knight (in Cartwright, 1997) is that students may not be competent to judge their own work - self assessment can be affected by overconfidence or by low self esteem. But perhaps a greater concern is that researchers have found low agreement between self assessed grades and those awarded by

educators and peers (Staniforth, 1997). While a student's accuracy in self assessment can improve with experience, Keefer (in Staniforth, 1997) found that as students gained more experience at tertiary study they could more accurately self assess, this is mediated by their self concept and past performance as measured by their Grade Point Average. Staniforth (1997) further noted that students were resistant to self assessment, found it difficult and many thought that it should remain the responsibility of educators.

Peer Assessment

As a means of meeting educationalists, end users and students expectations peer evaluation of group work, cross-cultural field work and practicum's has some distinct advantages. In peer assessment the students assume responsibility for providing feedback, comment and assessment of the work of their fellow students. A major advantage (as with self assessment) is that it more closely replicates the professional and working environment (Cartwright, 1997) as this is where independent judgment of others' work is often required. Peer assessment can help "...students to become more autonomous, responsible and involved." (Cartwright, 1997:57). It can create a more supportive environment where students have the advantage of greater feedback on their performance while at the same time developing an ability to analyse the work of their peers. Peer assessment allows students to evaluate their own performance in relation to their peers (norm-referenced assessment) against a negotiated set of criteria (criterion-referenced assessment) (Print, 1993). An additional added advantage of peer evaluation is that it can reduce the marking load of assessors (Cartwright, 1997).

As with self assessment, peer assessment is not without its problems. Peer evaluation, like self assessment, is prone to issues such as the competency or experience of students to evaluate their own work and that of others. The process is also open to criticism that students may not take the process seriously. Students may simply evaluate performance on the basis of its entertainment value or the popularity of the student being assessed. A further criticism of the process is that students may be wary of the process for fear of bias, discrimination or misunderstanding. Some of those who have implemented peer assessment have found it to undermine student confidence and the solidarity of peers and to create a state of resentment and hostility (Cartwright, 1997). While these criticism can be overcome this appears to be very much dependent on the dynamics of the particular cohort of students involved in the process and the learning environment (Angelo & Cross, 1993). Apart from causing anxiety to students for educators there are also issues with regard to consistency of marking.

Multi-modal Evaluation: A pragmatic response to contextual constraint

While educationalists have always been mindful of the need for their services to meet the needs of end users, the current environment is becoming increasingly pragmatic. There is a drive to resolve apparent conflicts of interest with dissonant and disaffected sections of the broader Australian society driven in part by a willingness in some sections of society to use the media to advance their particular agendas. Within this environment the challenge for educationalists is to develop an evaluation tool by which the sometimes apparently conflicting assessment needs can be met in a process that accords equality to the various interest groups. When the views of the dissonant and disaffected are accounted for in evaluation the potential for conflict and social disharmony are reduced.

Multi-modal evaluation (MME) offers educationalists a mechanism via which local situational constraints can be accounted for within an implementation and evaluation process that incorporate the best features of the three modes of assessment outlined above. This process of evaluation involves a combination of assessments including the educator (single source), the student (self assessment) and peers (peer assessment), who may include fellow students and practicum mentors (each interest in the assessment process being equally represented). This mode of evaluation overcomes many of the impediments that the other forms of evaluation suffer when administered alone. While the educator has a significant role in the process (they can prevent a student from achieving more than a 66% grade) perceptions of their potential bias are lessened because of the role of the other assessors in the process. This is particularly the case where the criteria for peer and self assessment are the result of negotiation between the parties concerned. The potential for students to grade work inappropriately through inexperience, low self esteem or bias towards or hostility against their peers can be mediated

by the negotiated marking criteria and the assessment of the educator. The potential for popular students to benefit disproportionately in grading is mediated by the others in the assessment process (for group work performance the resulting grade is shared equally between the members). When evaluating self assessment, Staniforth (1997) found that many of his students would have preferred to be peer assessed and there was an underlying feeling that the responsibility for self assessment was an imposition. MME shares the burden of assessment. The concerns of many educationalists, that students and peers may not take the process seriously by inflating grades, are addressed (Staniforth, 1997). The potential inconsistency between self and peer assessment and that of an experienced assessor is ameliorated as they have the power to reduce inappropriate grades significantly. However this power should be exercised with caution otherwise it may engender feelings of powerlessness and reinforce the surface learning strategies which MME seeks to overcome. This mode of evaluation overcomes many of the impediments that the other forms of evaluation suffer when administered alone. While the role of the educational assessor and the auspice organisation in cross-cultural situations is significant in the process of evaluation, the perceptions of hegemonic control are lessened through the incorporation of the voices of the disaffected. The potential for those involved to evaluate group work, cross-cultural field work and practicum's inappropriately through inexperience, low self esteem or bias towards or hostility against those involved is mediated by others involved in the evaluation process. From a procedural point of view MME incorporates the best features of assessment and addresses the attendant shortcomings that result from decisions isolated by physical and socio-economic distance.

MME encourages and rewards the incorporation of the 'local' context in the formulation and development of group work, cross-cultural field work and practicum's. Local consultation and the negotiation of curriculum with peer evaluators of group work, cross-cultural field work and practicum's become integral to the success of the process and provide a feedback loop that is largely missing from evaluation processes. While accreditation on professional and national competency criteria mediates local input, evaluation processes that involve input from situational contexts improve the likelihood that the learning which results will be more useful in application to 'real world' situations. And while there may be difficulties in applying what is learned and appropriate in one context to another it is likely to be more applicable than classroom only learning.

All participants in MME are an integral part of programs, services and research implementation, in equal partnership with other stakeholders (Government officials, service professionals, cultural interest groups etc) rather than subjects and recipients of educational services and programs. The educational program is owned by those with whom it is implemented. When a mechanism is implemented that allows the educational processes to be owned by the participants then the result will be embraced. While the context may differ according to the environment into which educational programs, services or research projects are implemented MME allows them to be compared against each other. MME is a measure of the engagement within and perceptions of the process of implementing programs, services or research projects. The greater the score that each of the parties award to this process the greater the potential that it will be successful by the measures used by the parties to evaluate the programs, services or research projects. The learning that result from this process, as argued above, have a greater likelihood of being applicable as they are owned by all parties in the evaluation process. In essence it overcomes a major problem in cross-cultural interaction in that it accords equality to cultural viewpoints without requiring the re-examination of ontological beliefs. While Western rationality demands that the cognitive dissonance that results from differing 'truths' be resolved (one way or the other) MME requires no such re-evaluation or contextual schizophrenia as a number of views can be accorded equality within the evaluation process. Dissonant voices are accorded a place and have a role in shaping the evaluation process. The equality accorded to these voices is more consistent with ethical practices in that they ensure that educational programs, services or research processes are fair, non-maleficent and beneficent. The result of this form of evaluation offers greater predictability of successful learning outcomes as the end users are empowered to influence and be influenced by the education process.

MME addresses the issues that affect other forms of evaluation within particular contexts such as cross-cultural field work and practicum's. It is particularly suitable in these situations as it does not require a re-examination of ontological or epistemological beliefs that result from cognitive dissonance when evaluation across-cultures fail (Morgan 2003). Multi-modal evaluation goes some way towards meeting the needs of educators for an evaluation process that reduces charges of hegemonic bias where there is some latitude in assessment. It allows unlike programs to be compared, predictions of success to be made and encourages greater engagement in the assessment process. While multi-modal evaluation is useful it is not suitable for all evaluation contexts, it will not save on time and resources and while it has applicability between contexts it will not provide an objective measure of value from one context to another. The main advantage of multi-modal evaluation is that it offers a way of representing and accommodating the diversity of views of disaffected groups within the dominant higher education systems of Western cultures while engaging students in the process.

In an increasingly pragmatic service environment where economic rationalism prevails, the criteria that funds are allocated in a manner that meets stated objects provides a perfect opportunity for the implementation of evaluation methods such as MME. Multi-source, multi-voice differences are resolved through a partnership process where all parties are accorded equality. MME offers a pragmatic response to the demands of service environments for evaluation processes which allow comparison between unlike programs with appropriate predictors of success.

Concluding Remarks

Evaluation has not occurred free of context. It has become an issue because specific local factors are deemed to be irrelevant and have been ignored in the process. The result has been a continuation of hegemonic oppression and the marginalisation of disaffected social groups such as Indigenous Australians. Despite the need to represent an increasingly diverse society with its multiplicity of cultural and socio-economic social groupings they have yet to be accorded equality of input into the evaluation process. They must contend with evaluation practices reflective of Western hegemonic cultural approaches and assumptions that are reductionist, allow little space for differing views, no accommodation of views that do not accord with Western predispositions and evaluators who will accept only the views that can be represented in Western taxonomies. This has resulted in the perpetuation of the dominant hegemony despite inherent inconsistencies. MME offers a mechanism through which local situational constraints can be accommodated, encourage greater engagement by community, engender community empowerment and build support for and trust in educational processes between students, community and end user organisations. From a cross-cultural perspective this approach does not require a re-examination of ontological or epistemological beliefs as the cognitive dissonance that results from differing 'truths' does not need to be resolved. Cultural viewpoints are not tested for validity nor is the process owned by any particular entity, all are accorded equality within the process.

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Mun Fie Tsoi, Ngoh Khang Goh and Lian Sai Chia, Nanyang Technological University, Singapore Emerging Pedagogy for Multimedia Learning: A Hybrid Learning Model

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ABSTRACT

In multimedia learning environment, learners can be provided with rich and diverse learning experiences. Therefore, it is important that the process of methodological design and development of multimedia learning materials whether they are to be delivered in form of a CD-ROM or the World Wide Web be guided by sound educational theories. This paper provides insights on an emerging pedagogy, a hybrid learning model for interactive multimedia design conceptualized from the Piagetian learning cycle model and the Kolb's experiential learning model.

This hybrid learning model represents learning as a cognitive process in a cycle of four phases, namely, Translation; Scaffold; Operational; and Integration. This model is intended to address both concept learning and learning styles inclinations. In the Translation phase, interactive multimedia experiences are translated into beginning ideas or concepts to be further engaged in Scaffold phase which involves logical chain of events embedding episodes of thinking, guiding and reflecting. The Operational phase is vital for the concept to be operationalized and it entails meaningful functionality for concept internalization while the Integrating phase provides the setting for the same concept to be integrated in different context or with other concepts. Pedagogical principles of the hybrid learning model are applied to the discipline of science and chemical education, for example, the Mole, an abstract concept. This is illustrated in terms of instructional storyboarding, and the e-learning product evolved including the science of instruction in training in self-questioning and transitioning to independent problem-solving.

INTRODUCTION

In multimedia learning environment, it is important to design course materials that can cater for individual needs while promoting concept learning (Tsoi et al. 2001). Therefore, it is vital that the process of methodological design and development of course materials whether they are to be delivered in the form of a CD-ROM or the World Wide Web be guided by educational theory. Indeed, the true value of multimedia learning environments have yet to be proven fully, and yet the adoption of newer technology and creation of more products move on (Adam, 1993; Norman and Spohrer, 1996)

Although instructional designers of multimedia learning environments often have enormous amount of information, proven instructional methods and powerful multimedia systems, it is still a difficult task to create and produce effective multimedia materials. This is more so especially due to lack of effective yet practical design model for organizing and designing multimedia materials (Tsoi et al. 1999; 2000; 2002).

With this in mind, the following sections provide an insight on a conceptualized hybrid learning model for interactive multimedia learning design.

HYBRID LEARNING MODEL

The hybrid learning model (Tsoi et al. 2003) is different from the traditional model of "Transmit-Receive" which when applied to multimedia learning, has so far failed to engage learners in meaningful learning. (Scardamalia and Bereiter, 1993). As such, this hybrid learning model for the design of multimedia aims to enhance concept learning as well as to cater to different learning styles.

The theoretical basis of this hybrid learning model is derived from the Piagetian learning cycle model and the Kolb's experiential learning model.

Results from cognitive studies have revealed that the model that is closest to the way we learn is that of the Piagetian learning cycle model. This inquiry-based student-centered learning cycle represents an inductive application of information processing models of teaching and learning. Besides, the learning of the content, the thinking processes involved in the construction of knowledge is also emphasized. The learning cycle model has three phases: exploration, concept invention and concept application (Karplus, 1977; Renner and Marek, 1990; Lawson, 1995; Lavoie, 1999). The shift in the critical thinking skills paradigm will be from inductive to deductive.

The three phases are arranged in a logical cyclical sequence. The exploration phase focuses on "what did you do?" while the concept invention phase centers on "What did you find out". In other words, "Is there any pattern to the data acquired?" and "What does it mean?" Finally, the concept application phase allows the student to explore the relevance of the concept and its application to other examples. Indeed, these three phases are similar to Piaget's assimilation, accommodation, and organization phases.

The Kolb's experiential learning cycle (1984) represents learning as a process of translating experiences into concepts, in a cycle of four stages, namely, concrete experience, reflective observation, abstract conceptualization and active experimentation. In other words, learners will progress through a learning cycle in which experience will lead to observation and reflection, which will then lead to concept formation. The development of concept in turn will lead to new experiences and further experimentation, in a cyclical experiential learning cycle (Kolb, 1984).

The concrete experience stage needs to be engaging, thus it focuses on "doing". The previous experiences of the learner will be drawn upon and new task-oriented experiences will be provided. The next stage, reflective observation is about the "understanding the doing". Synthesis of meanings and organization of reflection including rhetorical questions, for example, "How does this fit together?" or "How does this fit with what I already know?" are provided. The abstract conceptualization stage focuses on the "understanding" part while the stage of active experimentation is about "doing the understanding". This stage allows application and links theory and practice.

Indeed, Kolb's research has led to four learning style inclinations: accommodator, diverger, assimilator and converger. A learning style inventory has also been developed by Kolb (1984) to help learners know their strengths and weaknesses. It measures the learner's preferences in the four stages of learning cycle. A preferred learning style is indicated by preference of one or more stages over others.

Bostrom et al. (1990) conclude that learning styles are an important factor in computer-based training and learning. Their design suggestions are that "concrete learners (divergers and accommodators) be provided with analogical conceptual models. Abstract learners (convergers and assimilators) perform equally well with both analogical and abstract models, but benefit most from abstract models. Reflective observers (assimilators and divergers) may require a construct-based training. Active experimenters (convergers and accommodators) benefit more from a discovery mode of training provided by the applications based methods."

Hence, a synthesis of both the Piagetian learning cycle model and Kolb's experiential learning cycle model has evolved a hybrid learning model. This hybrid learning model termed the TSOI[®] model represents learning as a cognitive process in a cycle of four phases: **T**ranslation, **S**caffold, **O**perational, and **I**ntegration. This model is intended to address both concept learning and learning style inclinations. Figure 1. shows the four phases of the TSOI[®] model of learning.

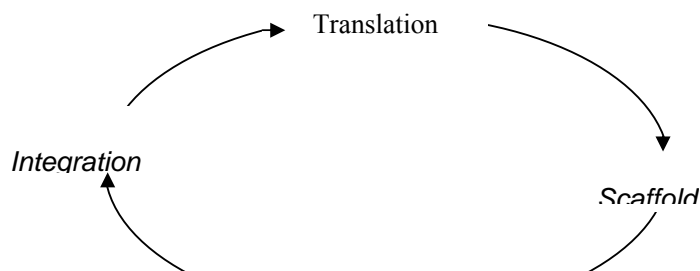


Figure 1. TSOI[®] model of learning

For illustration, in the science and chemical education, the mole concept, an abstract concept is used (Tsoi et al. 1998). The subtopic 1 is relative atomic/molecular mass, Avogadro's number and Mole. In the Translation phase, the activity can take the form of explorations. Here, an investigation on the relationship between mass and number of particles is carried out. The experiences are translated into a beginning idea or concept of mass ratio which is needed to understand Avogadro's number and Mole in the next phase, Scaffold. Scaffolding can take place as a chain of events of sequencing, guiding and reflecting shown in Figure 2, 3, 4 and 5 as samples of instructional storyboarding.

S/N	Animation	Narration	Text on Screen
1.2b	Display Diagram A <ul style="list-style-type: none"> Reuse for 1.2c Pop-up box for keying in response/Enter. Pop-up feedback box. Diagram A, response box and feedback box are to be on the same fixed screen.	Let's compare the following masses of atoms. What can you say? The different atoms are compared to the mass of carbon. The carbon atom is taken as the reference point. What can you imply? What have you observed? The actual mass of an atom is very small. Because of this, we need to compare masses of different atoms with each other. How do you do it?	Relative Atomic/Molecular Mass, Avogadro's Number and Mole <i>Physical Meaning</i> - Relative atomic mass, A_r This activity is for understanding relative atomic mass in terms of its physical meaning. 1. Carbon is given a relative atomic mass, A_r of 12. 2. The relative atomic mass is a number used to compare the masses of different atoms. It has no units.

Figure 2. Instructional storyboarding

The second activity as in Figure 2 on "physical meaning" at a microscopic (particle) level involves the learner comparing the masses of various atoms with annotations. For example, a carbon atom weighs 12 times as much as a hydrogen atom, a magnesium atom weighs twice as much as a carbon atom, a sulphur atom weighs twice as much as a hydrogen atom, etc. are provided. The various atoms are displayed with the appropriate color and size. This is essential to enhance the first activity on finding out how heavy is a single atom of carbon leading to the idea that the actual mass of an atom is very small and hence, the need to compare masses of different atoms with each other as well as the previous activity on mass ratio.

The opportunity to create your own relative atomic mass scale as illustrated in Figure 3 and 4 provides yet another concrete experience to understanding the concept of relative atomic mass. The learner will then make use of the created relative atomic mass scale to respond to a question on relative atomic mass by keying in the appropriate values. These activities will lead to the fundamental concept that relative atomic mass is a number used to compare the masses of different atoms and it has no units.

S/N	Animation	Narration	Text on Screen
1.2c	Display diagram B1 and diagram A <ul style="list-style-type: none"> Student's creation matches diagram B2 	Use information in diagram A to create your relative atomic mass scale. Drag the carbon atom to the relevant point on the scale. Place the other atoms appropriately on the scale. Put in the relevant descriptions.	Relative Atomic/Molecular Mass, Avogadro's Number and Mole <i>Physical Meaning</i> - Relative atomic mass, A_r To summarize, you are to create a relative atomic mass scale.

Figure 3. Instructional storyboarding

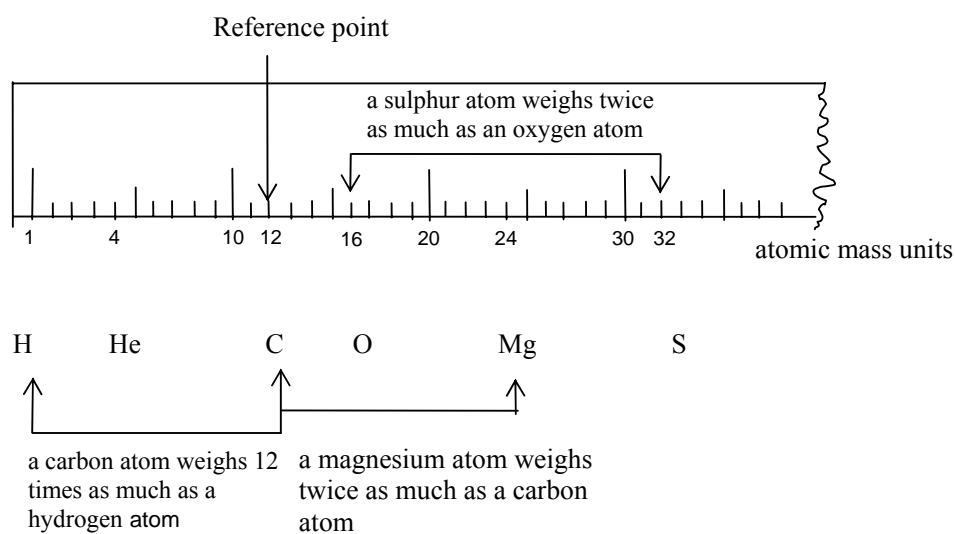


Figure 4. Relative atomic mass scale

S/N	Animation	Narration	Text on Screen
1.2g	Both balanced pictures remain showing number of particles to be 6.02×10^{23} and the respective masses. Pop-up box for keying in response / Enter. Pop-up feedback box. Diagrams, response box and feedback box are to be on the same fixed screen.	Compare the two diagrams. What have you observed in terms of mass & number of particles? How are the observations in this activity alike?	Relative Atomic/Molecular Mass, Avogadro's Number and Mole <i>Physical Meaning</i> - Avogadro's Number and Mole 1. The masses of a mole of atoms of 2 different elements are not equal. 2. The number of particles in a mole of atoms of 2 different elements are equal. 3. The number of particles in one mole of any substance is 6.02×10^{23} called Avogadro's number.

Figure 5. Instructional storyboarding

The activity in Figure 5 provides an avenue for infusing thinking skills and consolidating the understanding of the physical meaning of Avogadro's number and Mole as well as their relationship before proceeding to the Operational phase which is vital for concept formation.

The initial activity focuses on the physical meaning of Avogadro's number and mole. The learner chooses a mole of atoms of an element from the periodic table and balances it with the correct number of particles. This is then repeated with a different element. The element when dragged onto the balance is represented appropriately at room temperature and pressures either in its solid state or if in its gaseous state, it will be in the form of a balloon as well as in its chemical formula or symbol.

In this way of representation, a macroscopic as well as a symbolic view is provided. Finally, the learner has the opportunity to compare these two diagrams in terms of mass and number of particles. The learner can also check the observations made to the feedback given.

In this Scaffold phase, various relevant and meaningful activities are designed logically and sequentially. The learner is guided interactively to understand the physical meaning of relative atomic mass as well as relative molecular mass. This is then further expanded to the physical meaning of Avogadro's number and mole elaborating to how Avogadro's number is related to mole. Conceptually, the three key points observed as shown in Figure 5 is essential to understanding the relationship between mass and mole as in the beginning activity of the third phase, the Operational phase.

S/N	Animation	Narration	Text on Screen
1.3a	<p>4 s pause before showing this text.</p> <p>4 s pause before showing this text.</p> <p>Display diagram A1 → A2</p> <p>Show the equation.</p>	<p>You have learnt that relative atomic mass is a number used to compare the masses of different atoms.</p> <p>What is the relative atomic mass of carbon?</p> <p>What does this mean?</p> <p>Let's see how the relative atomic mass is connected to mass and mole.</p> <p>Match the items. So, the relationship between mass and mole is connected by relative atomic mass as shown.</p>	<p>Relative Atomic / Molecular Mass, Avogadro's Number and Mole Relationships</p> <p>- Moles of atoms</p> <p>The following is about the relationship between mass and mole.</p> <p>The relative atomic mass of carbon is 12.</p> <p>This means that one mole of carbon atoms weighs 12g.</p> $\text{Number of moles} = \frac{\text{Mass}}{A_r}$ <p>Where mass is in grams A_r is relative atomic mass.</p>

Figure 6. Instructional storyboarding

This Operational phase entails meaningful functionality whereby the concept is operationalized as shown in Figure 6. Quantitative relationships in the form of mathematical formula are acquired through relevant activities as shown in Figure 6 to allow operability of the mole at the three levels, namely, the macroscopic, microscopic and symbolic.

The relationship between mass and mole as connected by relative atomic mass is acquired meaningfully for further extension to the connection by relative molecular mass. Besides, self-questioning is embedded and the use of conversational style as in the personalization principle (Mayer, 2001) is also applied. Generic questions such as “How are the observations in this activity alike?”, “How do you do it?”, are provided for self-questioning as shown in Figure 2 and 5. The format of an example followed by a practice problem is adopted rather than a few examples followed by a few practice problems.

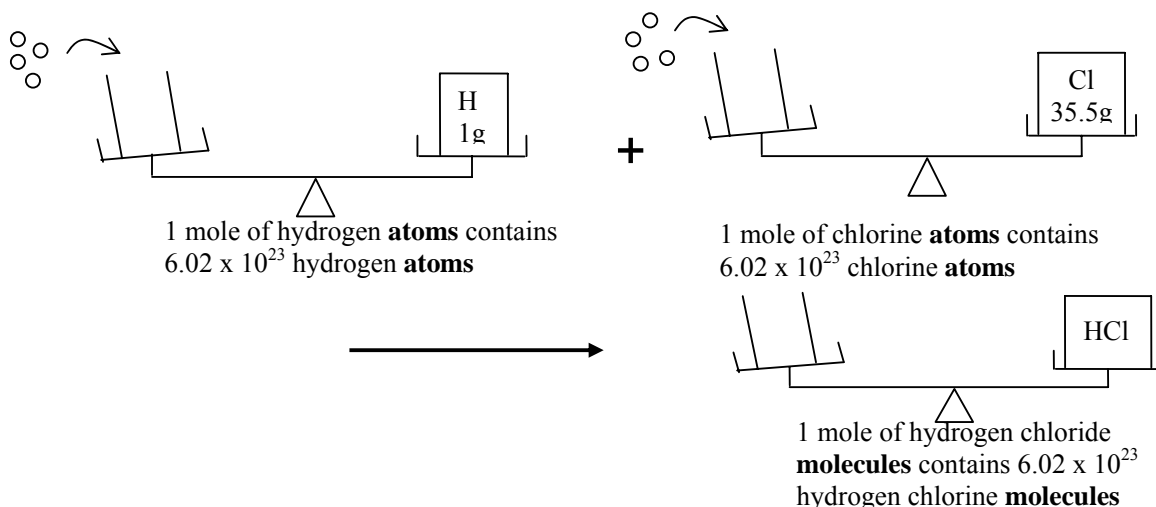


Figure 7. Interactive activity

Figure 7 shows an example of an interactive activity which is inductive in nature leading to not only forming a mathematical relationship between mass of a molecule and mole but also generalizing a relationship between mole and number of particles which is one mole of any substance always contains the same number of particles, 6.02×10^{23} called the Avogadro's number and in this context, the particles can be atoms or molecules.

In this activity, the learner observes at both the particle level (microscopic level) and symbolic level by balancing with the correct number of particles which are either atoms or molecules. This activity centers on the understanding of the meaning of the relative molecular mass of hydrogen chloride as 36.5. This is then continued with more instructional events focusing on understanding various observations in terms of moles and number of molecules leading to forming a relationship involving molecules between mass and mole as connected by relative molecular mass. Simple examples and practice problems are also provided on this mathematical relationship.

In the Integration phase, relevant and diverse problems are provided. This involves the application of the mathematical relationships between mass and mole as connected by relative atomic mass if it is an element and by relative molecular mass if it is a compound. On completion of the problem solving, the learner is posed review questions such as "what have you learnt regarding one mole and number of particles?" and "how is the mass of substance connected to the mole?" with reference to element and compound.

CONCLUSIONS

The hybrid learning model, the TSOI[®] model of learning has great potential as a pedagogical framework for the design of interactive multimedia learning. The delivery mode can be either in the World Wide Web or in a CD-ROM. Besides, principles of Multimedia, Contiguity, Modality, Redundancy, Personalization and Coherence are also applied to the multimedia design (Mayer, 2001).

The need to first identify the attributes of the concept is essential so that varied activities in the 4 phases can then be "crafted" appropriately and meaningfully to assist the learner to be able to identify these critical attributes and eventually leading to acquisition of concept mastery and exposure of learner styles inclinations. Various resources, for example, journals related to science and chemical education, science periodicals on teaching ideas, science magazines, books on science learning cycle, experiential learning model, teaching and learning strategies, multimedia leaning as well as multimedia courseware, etc can be used to spin off innovative ideas relevant and appropriate for the design of activities.

Knowing the attributes of the concept is not enough. To have a complete picture, one also needs to be aware of the misconceptions or learning difficulties arising from the teaching and learning of the concept. Such misconceptions can be confronted in the Scaffold phase which is similar to the reflective observation stage of the experiential learning cycle.

The Translation phase is similar to the exploration phase of learning cycle model and the concrete experience stage of experiential learning cycle. This is where interactive experiences are translated to beginning ideas or concepts to be further engaged in the Scaffold phase which is similar to the concept invention phase of learning cycle model. It is here that learner's understanding is guided by relevant activities, worked examples, practice problems and learner's reflection is embedded in the instructional content via self-questioning. The varied activities are logically sequenced to help learner to identify the attributes of the concept.

The Operational phase similar to the abstract conceptualization stage of the experiential learning cycle involves increasing the understandings of the relationship between thinking and concept acquisition. The operational phase is crucial as it functions to not only operationalize but also internalize the concept and prepare the learner to be operationally ready for further engagement in applications in the Integration phase. This Integration phase is similar to the concept application phase of learning cycle model as well as the active experimentation stage of experiential learning cycle. It provides the setting for the same concept to be integrated in different context or with other concepts.

It is essential to be aware that even with instructional storyboarding, the entire development process is iterative in nature between the author and the multimedia producer as well as the graphics designer. Equally important is also the knowledge of multimedia design principles and its appropriate application in multimedia learning. In essence, the TSOI[©] model of learning, a hybrid learning model has the capacity to address both concept learning and learning style inclinations.

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Nisbet, D. The Robert Gordon University, Scotland. Designing a Best Practice Template for the facilitation of collaborative learning in online discussion groups

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Abstract

This paper reports on the final stage of a research project examining the facilitation of asynchronous online discussion group interaction. An earlier stage of the project investigated the measurement of online discussion group interaction and the creation of a Discussion Group Interaction Tool (DiGIT). This tool provided an array of output parameters (results factors) related to the quantity and quality of interaction. Enabling factors (input parameters) were also postulated that the case research indicated had a facilitation effect on discussion group interaction. These enabling factors are: [1] learning design and assessment, [2] tutor management and skill, and [3] peer-related learning. This paper reports on the final stage of the research, where the enabling factors were further validated in a wider study of e-learning practice. On the basis of this, a Best Practice Template is proposed. This research will provide a contribution in providing an approach to the facilitation of positive collaborative learning in online educational programmes.

Key Words

Online interaction, measuring interaction, interaction quality, group interaction, best practice, asynchronous discussion, collaborative learning.

Introduction

The increased use of networked learning environments has encouraged debate about how the classroom can be simulated at a distance. Where the learning takes place online through the Internet, facilities such as online discussion groups, chat facilities and e-mail are key parts of the Virtual Learning Environment (VLE). This paper reports on the final stage of a research project examining the facilitation of asynchronous online discussion group interaction. An earlier stage of the project investigated the measurement of online discussion group interaction and the creation of a Discussion Group Interaction Tool (DiGIT). This tool provided an array of output parameters (results factors) related to the quantity and quality of interaction. Four enabling factors (input parameters) were also postulated that the case research indicated had a facilitation effect on discussion group interaction. This final stage of the research has tested the validity of these enabling factors within the online learning community and the more detailed examination of the Best Practices (Neal, 2000) that underpin these factors. The objective of this final stage is to compare the earlier findings with the experience of online educators worldwide and on the basis of this, to design a Best Practice Template for the facilitation of collaborative learning in online discussion groups.

Community of Learners Concept

The differences between an asynchronous discussion group and a face-to-face classroom situation has led to significant discussion in e-learning literature about the importance of social interaction in the learning process (Driver, 2002; Nicol et al, 2003; Vonderwell, 2002). Related to these social aspects of learning is the idea of a 'community of learners' (Johnson, 2001; Johnson et al, 2002; Rovai, 2001, 2003, 2004). It is suggested that *'there must be proper attention to community building in distance-education programs, because it is the sense of community that attracts and retains learners'* (Rovai, 2001: 109-110). A key concept related to 'communities of practice' is that in a community the sum of knowledge is greater than the sum of individual participant knowledge. Related to constructivism, two aspects of collaboration can be seen to be facilitated in such a community: peer interaction and expert-to-apprentice interaction (Johnson, 2001). Due to the importance of context, different learner experiences will inform and enhance the learning experience. Roberts (2002) emphasises the importance of the relationship between interaction and reflection and

the importance of personal perspective and individual orientations to work and education. The underlying theoretical proposition in much of this thinking is that of ‘Transaction Distance’ (Moore, 1993 in Rovai (2002a) and in Tait (2003)). The basis of this theory is that the space between the learner and the structure of teaching must be mediated by dialogue, thus emphasising the importance of the online discussion.

Best Practices in Online Interaction

Of the wider literature on the evaluation of e-learning programmes (McGorry, 2003; Rovai, 2003) much relates to interaction. The measurement of interaction using the Content Analysis approach appears to be the more fruitful for the examination of the underlying facilitating factors, rather than the feedback method, which had been explored in previous studies (Nisbet, 2003).

The Fahy (2003) Transcript Analysis Tool (TAT) provides an example of an explicit classification of online interaction which defines types of questions and statements, reflections, scaffolding/engagement and quotations/citations. This approach was given experimental practical application in the design of online tools by Campos (2004). The Salmon (2000) model was used as a basis for measurement of interaction quality in DiGIT (see Appendix A). The model has 5 stages (see Table 1).

<i>Stage</i>	<i>Learner Evidence</i>	<i>Online Tutor Role</i>
1: access and motivation	accessed discussion forum and posted their first message	solve access problems and encourage participation
2: online socialisation	introduced themselves and ‘share a little of themselves’	Create an atmosphere of mutual respect and defuse differences of opinion
3: information exchange	exchanges flow related to course content	organising productive discussion
4: knowledge construction	formulation of ideas through discussion and collaboration	build and sustain the group learning process
5: development	responsible for own learning and its construction	Supporting and responding as required

Table 1: Model of teaching and learning through online discussion groups (Source: adapted from Salmon, 2000)

Enabling Factors for Effective Online Interaction

Three enabling factors were postulated as being possible input parameters in DiGIT to online interaction (Nisbet, 2004):

- [1] learning design and assessment;
- [2] tutor management and skill;
- and [3] peer-related learning.

[1] Learning Design and Assessment

The importance of assessment as a means of facilitating collaborative learning in general and online discussion group activity in particular is highlighted by Macdonald (2001 and 2003) who emphasises ‘not only must the assessment be appropriate to the subject content of the course, it also must have an important role in supporting course pedagogy’ (Macdonald, 2003: 378-379). Referring to the Salmon (2000) Model, Macdonald notes that at all stages in the development of competence in online collaboration, there may be the need for these to be reflected in the design of the assessment. Macdonald (2003) also explained that there are a variety of ways in which individual contributions can be assessed. For example, students may contribute in terms of group moderation or alternatively in locating sources of information. This concurs with Vonderwell (2003) who provides an example of a points system where points are awarded for contribution, but also judges are appointed to evaluate contributions and they are also awarded a points value for this activity.

Related to assessment are the aspects of learning design. Lamy and Hassan (2003) note that distance learners cannot be easily persuaded to undertake interactive reflective work if the task presentation is not explicit in the expected requirements. Keeton (2004) found that online faculty highly endorsed principles that focused on the processes of learning rather than assessment of their outcomes: *‘When students are able to voice opinions, share experiences, and question ideas and instructors are able to interact with students on a mentoring level, then the classroom is a dynamic learning community rather than a pre-designed or teacher controlled course’*.

On the basis of this literature, alternative Learning Design and Assessment Best Practices were identified (see Table 2).

Learning Design	Assessment
activities that encourage group discussion	Discussion participation encouraged but not assessed
activities that encourage collaboration in finding information	Final assessments based on earlier discussion in part
initial ‘socialisation’ activities	Final assessments fully based on earlier online discussions
clear requirements that students have to undertake in group discussion	Learners participation in online discussions assessed individually
a free-ranging approach that permits exploration without specific activities	Group assessment is made for online discussions
	Required minimum amount of participation is awarded a proportion of the grade without assessment of quality
	Learners assemble a portfolio of evidence of discussion participation which is graded for both quantity and quality

Table 2: Alternative Best Practices for Learning Design and Assessment

[2] Tutor Management and Skill

With regard to tutor management and skill, Tanner and Jones (2002) emphasise the importance of ‘scaffolding’ for encouraging reflection in action. Related to the ideas of transactional distance (previously discussed), research by Baker (2004) indicates that the more instructors incorporate relationally supportive language, the more students will benefit from the online learning experience. Social interaction between learners and instructors occurs when instructors adopt strategies to promote interpersonal encouragement or social integration (Jung et al, 2002). Finally, the importance of timely responses from online tutors is an important practical factor (Clark, 2001).

Research into online instructional practices by Keeton (2004) provides information about underlying principles for good practice. Of these principles, faculty regarded the creation of an environment that supports and encourages enquiry as being the most important. Other important principles included the eliciting of critical reflection and providing prompt constructive feedback. Ross et al (2004) provided an investigation that emphasised the importance of tutors being aware of how students operate in an online learning environment. Key elements of tutoring an asynchronous discussion include such aspects as: emphasising the importance of collaborative interaction and promoting expectations that students should develop their contribution throughout the discussion (Ruhleder and Twidale, 2004). On the basis of the literature Best Practices related to Tutor Management and Skill were assembled (see Table 3).

Standards for response times for online tutors
Peer review of online tutoring
Training for online tutors
Audits of discussion group activities
Measurement of the quantity of online discussion group activity
Measurement of the quality on online discussion group activity

Table 3: Best Practices related to Tutor Management and Skill

[3] Peer-related Learning

Anderson (2003) develops an 'Equivalency Theorem' based on experience and feedback on online programmes and the educational literature debate. The theorem suggests that deep and meaningful learning is possible as long as one of the main forms of interaction is at a high level: student-teacher; student-student; student-content'. The particular importance of student-student interaction is highlighted as the basis for collaborative approaches to learning (Cummings et. al, 2002; Driver, 2002). Sharma and Maleyeff (2003) suggest that the self-managing group is another pedagogical strategy for internet educators. Teams could be responsible with educational goals and broad guidelines and would therefore be responsible for the pace and style of their own learning. Case, research and problem-based activities are suggested as potential mechanisms.

Methodology

It was considered that an online questionnaire would be highly suitable for a population of University e-Learning practitioners. A list of potential informed respondents was assembled from e-Learning conference proceedings, e-learning journals and various related web-sites.

With regard to response rates, of the 212 that viewed the questionnaire, 132 (62.2%) started the questionnaire and 73 completed it (34.4%). It was rather disappointing that only 55.3% of those that started the questionnaire actually completed it. The questionnaire used a fairly large amount of free-form text answers towards the end and this may have been off-putting to respondents. However, the richness of the comments provided added to the value of the survey.

There was an attempt to provide an international perspective to the study in relation to respondent location. Responses from the U.K. amounted to 30% of the total, with a further 11% from other European countries, 48% of respondents were from North America, with 11% from Australasia. The purposive sampling was successful in locating online tutors, authors and those supporting online education. Online tutors accounted for 20 responses, there was 16 responses from authors of online learning materials, 13 responses from managers of online educational programmes, 10 responses from educational support for online programmes and 17 other responses.

There was also a reasonable spread across academic disciplines with 34% in Social Science/Business/Law; 19% in Science/Medical/Engineering; 17% in Humanities/ Arts/Languages; 16% in Education and others being 14%. The respondents also profiled well in terms of their experience of online tutoring with 49% of the respondents having over 5 years experience of online tutoring, 39% with 1-5 years experience, 9% with less than 1 year's experience and 3% with no experience.

Findings

Best Practices in Learning Design

Activities that encourage interactive group discussion was the most frequently cited Best Practice related to learning design (n = 59; 83% of respondents), although collaborative information searches and socialisation type activities also scored a high frequency (see Table 4). It would appear that more prescriptive activity-based learning design is most favoured with little evidence of more free-ranging approaches. In the 'other' category practices such as '*frequent feedback on performance*', '*on-demand support*', and a design that '*encourages synchronous as well as asynchronous discussion*' was cited.

Activities that encourage interactive group discussion	59	83%
Clear requirements that students have to undertake in group discussion	50	70%
Activities that encourage collaboration in finding information	46	65%
Initial 'socialisation' activities	44	62%
A free-ranging approach that permits exploration without specific activities	15	21%
Other	16	23%

Table 4: Best Practices for Learning Design

Influence of Assessment

The most frequent assessment regime related to individual assessment (n = 40; 56% of respondents). The next most frequent assessment related to grades for participation only, with a slightly smaller frequency for grades for quality (see Table 5). There was a similar frequency of the use of final assessments which were partly based on earlier discussions, but there were very few incidences where assessments were fully based on earlier discussions. There was a low use of both group and peer assessment.

Learners participation in online discussion are assessed individually	40	56%
A required minimum amount of participation is awarded a proportion of the grade without judgement of quality	27	38%
Learners assemble a portfolio of evidence of discussion participation which is graded for quality	22	31%
Final assessed requirements are based on earlier online discussion in part	21	30%
Discussion participation is encouraged but not assessed	20	28%
A group assessment is made for online discussions	14	20%
Learners peer-assess discussion contribution	13	18%
Final assessments are fully based on earlier online discussions	4	6%

Table 5: Best Practices for Assessment

Influence of Tutor Management and Skill

There was a relatively low incidence of the use of best practices related to tutor management and skill (see Fig 1).

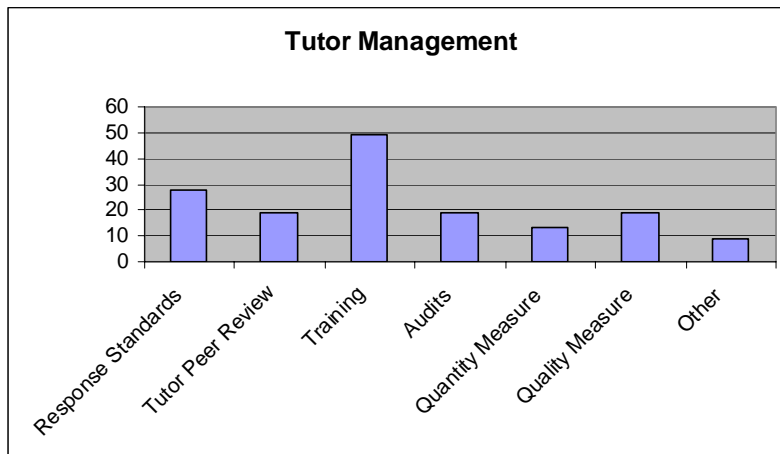


Fig 1: Best Practices Related to Tutor Management and Skill

Training was the most frequent best practice with 50 of the 70 respondents, although the corollary that 29% of respondents' organisation did not train online tutors must raise concern. 28 respondents (40%) had response standards, whilst peer review, audits and quality measurement all had 19 responses (27%). Only 13 respondents (19%) undertook quantity measurement. Of the 9 others, 4 respondent institutions had none of these best practices.

Influence of Peer Related Learning

Peer-related best practices appear to be in the minority throughout (see Table 6). The most frequent use of peers is for summarising discussions (43%), but only 22% of respondents use learners to chair discussions.

<i>Activity</i>	<i>Tutors</i>	<i>Learners</i>	<i>Not Used</i>
Chairing Discussions	69%	22%	9%
Summarising Discussions	51%	43%	6%
Allocating Roles and Duties	60%	24%	16%
Managing Discussions	72%	24%	4%
Assessing Contributions	80%	8%	12%

Table 6: Tutor and Learner Responsibilities in Online Discussions

When it comes to peer-related assessment of discussion contributions only 8% permit learners to undertake this activity.

Most Important Best Practices

The qualitative feedback on Best Practices provided most responses related to Learning Design with a variety of practices exhibited (see Appendix C). Assessment provided 16 responses and the provision of set requirements 14 responses, which when linked as part of Learning Design makes this the highest response factor.

The next most frequently cited Best Practices relate to Tutor Skill, when this is linked with Feedback this becomes the second most frequently cited factor. Peer-related learning had a low response rate which reflects the low use of the empowerment of students which was noted in the quantitative analysis.

Best Practices Related to the Staged Model

Respondents were asked which best practices they used to facilitate the various stages of the Salmon (2000) Stages Model (see Table 7).

<i>Stage</i>	<i>Most Frequent Best Practices</i>	<i>Newly Emerging Best Practice</i>
Access	Introductions [26] Learning Design [6]	
Socialisation	Introductions [13] Requirements [5]	Humour/Games [6] Discussion Zones [6]
Information Exchange	Learning Design [7]	Teams [10] Feedback/Reflection [9]
Collaborative Learning	Learning Design [16]	Questioning [11]
Knowledge Construction	Learning Design [6] Requirements [6] Teams [6] Feedback/Reflection [6]	Hands Off [3]

Table 7: Best Practices related to Staged Model

As might be expected, the use of introductions was cited as the most frequent best practice at the initial Access Stage. For many this included more formal induction programmes, which in some cases were face-to-face encounters whilst others were online. A large number of respondents used 'ice-breaker' activities, these were *'simple, socially-oriented, get to know tools and group,' 'I open with information about myself and the course'* and *'I share my biographical post and have students share biographical posts'*. There was no indication that best practices at this stage were not only non-threatening but also light-hearted: *'an ice breaker like tell three truths and a lie'* and *'I post a humorous introduction of myself and have students post an introduction of themselves'*. Best practices related to Learning Design include the use of group problem-solving and linking of questions and tasks to student interests.

The frequent use of introductions continues at the Socialisation stage and for most respondents it is clear that there is an effort to convert the initial access posting to a first discussion which is informal *'keep the atmosphere very informal'* social *'group activity early in the module which is primarily to enable students to introduce themselves'* and *'persona; stories that build relationships'*. A number of respondents established requirements for their students such as *'guidelines for effective online discussion'* and *'students are required to contribute, and to build upon one another's posted contributions'*; sometimes this was related to assessment *'students are required to reply to classmates in a substantive manner and are graded'*. Two significant best practices emerged at this stage, the first was building on the use of humour and the use of games: *'creating a playground and giving permission for students to post and junk'* and the use of *'online games'* and *'a scavenger hunt'*. Related to this was the emergence of the use of separate social-type Discussion Zones: *'social conference'*; *'pub or coffee house forum'* and *'course cafe'* were all mentioned.

At the Information Exchange stage Learning Design Best Practices returned to be more frequently and including *'participative and shared exercises'*, *'collaborative/co-operative learning techniques'* and *'research-based tasks'*. Related to this, the most important newly emerging best practices related to the use of teams and the use of peer-related learning where *'students are assigned group roles'*, with *'online student-led seminars'* and where tutors *'let students manage this aspect of group interaction'*. An important emerging tutor role was that of the provision of feedback and the encouragement of learner reflection. This was done by: *'positive reinforcement followed by a request for more information'*; *'pointing out particular commonalities or disagreements'*; *'instructor modelling'*; and *'encourage it, model it and let it happen'*.

At the collaborative learning stage the most frequent best practices related to Learning Design such as *'post interesting threads that lead to a variety of angles of discussion of topic'*; *'start with more structure and then ease off'*; *'ask participants to link their responses to the concepts being studied and their own experiences'* and *'structure a new ideas section within the discussion'*. The most frequent new practice emerging at this stage was the use of questioning by the tutor including *'reflective questioning'*; *'guided questioning'*; *'throw out thought-provoking questions or prompts'* and *'ask probing questions, elaborate, compare and contrast'*. At the Knowledge Construction stage there was a more balanced level of responses amongst the different categories of Best Practice. Learning Design included *'learner autonomy encouraged'* and *'helping them imagine, articulate and pursue their learning trajectory'*. An interesting emerging comment at this stage was related to the tutor's ability to be 'hands off' at this stage though *'trusting them to do so'* and *'promotion of leadership via criteria and feedback'*.

Conclusions

Two of the three enabling factors identified in the earlier research (Nisbet, 2004) and from the literature review (Learning Design and Assessment and Tutor Management and Skill) are clearly regarded as important in the facilitation of online discussion and collaborative learning. The third factor Peer-related Learning had more of a minority response. Best Practices related to Learning Design focus strongly on the use of activities to encourage interactive group discussion and collaborative research. The importance of having specific requirements concurs with Lamy and Hassan (2003). The link between discussion and learning outcomes was regarded as important. There is a variety of models being used as Best Practices for Assessment which concurs with the diversity found by Macdonald (2003). There is also a significant minority favouring encouragement rather than assessment. The use of 'socialisation' activities was a majority response, but considering the importance of social interaction in the 'community of learners' concept (Driver, 2002; Nicol et al, 2003; Vonderwell, 2002) a greater uptake may have been expected. Indeed, there is evidence that some regard separation of social chat from academic endeavour as the way forward, with the creation of 'cafes' and 'chat rooms'. With regards to Tutor Management and Skill there was a general lack of uptake of training, review or measurement related to online discussion. There was a minority use of peers in the learning process: summarising was the most prevalent use of the learner, whilst there was very little use of peer-related assessment of contributions. This indicates that Best Practices do not profile with the 'self-managing group' ideas suggested by Sharma and Maleyeff (2003). When related to the Salmon (2000) Stages Model, Learning Design Best Practices emphasise the importance of introductions and the socialisation process at the earlier stages of the model, with newly emerging best practices such as the use of humour and games. Tutor skills in the information exchange and collaborative phases of the model focused strongly on the importance of questioning and feedback/reflection taking place in a team-based environment. The findings have been assembled in a Best Practice Template (see Appendix B)

Limitations and Further Research

There are a number of limitations to this study. Different programmes and disciplines will have different learning objectives with regard to the importance of discussion as a knowledge-building mechanism. In addition, the international and institutional differences in approach require further investigation.

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APPENDIX A

The Discussion Group Interaction Tool (DiGIT)

The Salmon (2000) Model, together with established definitions for the stages, linked to traditional measures of discussion quantity, was used as the basis for the construction of the Discussion Group Interaction Tool (DiGIT) and this was evaluated using case research (Nisbet, 2004). DiGIT has been applied to evaluate growth (or otherwise) of interaction longitudinally within a module, between the same module in different cohorts and between modules at different stages in the progression of students within a programme

ENABLING FACTORS	RESULTS FACTORS	
Tutor Management and Skill	Quantity	
	Number	Student Initiated
	Length	Tutor Initiated
Peer-related Learning	Quality	
	[1] Access	
	[2] Online Socialisation	
Learning Design and Assessment	[3] Information Exchange	
	[4] Collaborative Idea Formulation	
	[5] Autonomous Knowledge Construction	

Discussion Group Interaction Tool (DiGIT)

In the research, the evaluation procedure using content analysis was found to be time-consuming and would not be appropriate for general programme evaluation. A suggested solution is that students could be made aware of the model and that they should peer review and self-assess their own contribution. The input of the code 1 to 5 could be part of the posting and extracted automatically as part of the software program.

APPENDIX B

Best Practice Template

Enabling Factor	Best Practice	Importance in Staged Model
Learning Design and Assessment	<ul style="list-style-type: none"> • Activities that encourage collaboration • Introductions/Socialisation/Games • Defined Requirements • Teams • Assessment of Discussion Participation Quantity • Assessment of Discussion Participation Quality 	All 1,2 All 3,4 1,2 3,4,5
Tutor Management and Skill	<ul style="list-style-type: none"> • Tutor training • Response, quality and quantity monitoring • Scaffolding/support • Humour • Questioning • Feedback/Reflection • 'Hands Off' 	All All 3,4 1,2 3,4,5 3,4,5 5
Peer-Related Learning	<ul style="list-style-type: none"> • Chairing and Summarising • Assessing Contributions 	3,4,5 3,4,5

APPENDIX C

Most Important Best Practices

Factor	Freq.	Examples
Learning Design	32	<ul style="list-style-type: none"> - 'ensure that discussion contributes directly to learning outcomes' - 'use of controversial or opposite opinions as stimulators' - 'scaffold entry into online interaction' - 'clear objectives, specific instructional design, focused tasks, clear assessment' - 'having a reflective de-brief' - 'flexibility with responsive active engagement for all' - 'balance between individual participation and group participation'
Tutor Skill	23	<ul style="list-style-type: none"> - 'knowing when to back off and let students talk' - 'trained in formulating questions that engender discussion' - 'ask open-ended questions' - 'teachers should only question and not answer' - 'offering opinions to encourage dialogue'
Assessment	16	<ul style="list-style-type: none"> - 'ensure that the discussion contributes directly to the learning outcomes' - 'tie discussion to course grade' - 'developing appropriate ways to assess what takes place in a discussion' - 'assessments have to be devised to allow class wide collaboration' - 'grading participation but not specific postings'
Set Requirements	14	<ul style="list-style-type: none"> - 'clarifying objectives and agreeing the conduct of the group' - 'clearly stated expectations' - 'require participation' - 'set expectations that students need to do the work themselves'
Peer-related	12	<ul style="list-style-type: none"> - 'student-moderated seminars' - 'involving learners in planning the activity (ownership) and giving them clear responsibilities (e.g. summarising). - 'peer empowerment' - 'roles rotate in student group' - 'getting the students to take on some of the instructor role' - 'assign students as moderators to summarise the discussion'
Feedback	12	<ul style="list-style-type: none"> - 'encouragement of learners by feedback to all early contributors' - 'tutor provides early corrective and reinforcing feedback' - 'model good online discussion behaviours' - 'a good evaluation of the discussion processes with the tutors AND the students' - 'tutors and experienced participants modelling good practice to novice online discussants'

Opatpatanakit A., Lertithikun S., Timkasikum W., Krairerks, and S., Wongjun, D., Chiang Mai University, Thailand. Partnership in Educational Reform: Collaboration of Local Community, University and Research Funding Agency

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ABSTRACT

This article describes how the local communities; university and research-funding agency have collaborated to empower the learning process of undergraduate students through integration of teaching, research and community service. Participatory action research has been applied as a research methodology. As the research counselor, the research core team, who runs the Center for Community-Based Research, has facilitated seven community-based research projects granted by the Thailand Research Fund (TRF). Two hundred second-year and thirty third-year undergraduate students were facilitated to undertake “practical training” in five communities. Additionally, these students were facilitated to further practice “student activity” through various student clubs’ activities. Thirty third-year students were facilitated to develop “special problem” as research projects either in those communities or in a new community. Through such a learning process, the Faculty of Agriculture, the Center for Community-Based Research, the Thailand Research Fund and local communities have gradually developed their collaboration. At the same time, those undergraduate students have learned and experienced more about local community, have developed their capacity in undertaking community-based research by which research problems were identified by the locals and have increased the effectiveness of the students’ clubs. Similarly, local communities have increased their ability to manage “student practices” so as to be the tool for further identifying community problems, analyzing causes of problems and solving problems through the participatory action research process by which students and Faculty staff become the co-researchers.

KEYWORDS: educational reform, collaboration, community-based research

INTRODUCTION

In Thailand, educational reform policy has been launched to improve the quality and effectiveness of education. At Chiang Mai University, for example, the immediate and long-term goal has been formulated in term of the University’s and Faculty’s vision, mission, objective, and yearly strategic action plan, and five-year plan. Research to serve local community better has become the major policy at the university, faculty and department level. At the university level, a center to strengthen research has been set up to systematically access new research funding and strengthen faculty staff. Additionally, at the faculty level, a Faculty research manager has been recruited to facilitate the faculty staff and students to engage more in research. Research performance is used as major criteria for the promotion faculty staff.

However, the performance of many undergraduate students demonstrates a lack in understanding of social situation. Ability in analysis and synthesis of social situations, ability in working on community-based research, facilitation, communication and writing is rather poor. Many undergraduate students in the Agricultural Extension Course, Faculty of Agriculture have similar performance problems. For example, “special problem projects” found to be the literature review of particular issue from written articles without critical analysis and synthesis. Only a few special

problem projects appear to deal with local community situation and such critical research questions as “what is happening in the selected local community, what conditions that contribute to the situation, and how to improve the situation”. This situation reflects that there is more to do to improve student performance.

It is not surprising that many undergraduate students who have grown up in local communities cannot analyze why villagers are getting poorer and becoming indebted even though they are working hard under the governmental “Village Fund” policy which has been implemented for years. As one of the faculty staff involved in this curriculum, my observation is that there has been less opportunity for undergraduate students to learn more about local communities, except some of those who come from those local communities. For such technical-oriented courses as Soil Science, Plant Pathology, Entomology, Animal Science, Horticulture, undergraduate students are mostly involved in laboratory work. Conceptually, for such facilitation-oriented courses as Agricultural Extension, undergraduate students are expected to increase their ability to do extension work and conduct research during four years of study. However, only some community-based activities organized by some lecturers, and 15 days of “practical training” in agricultural extension organizations or local villages have been organized to increase such ability.

DEVELOPING COLLABORATION WITH RESEARCH FUNDING AGENCY

My hypothesis is that collaboration among stakeholders involved in the learning process of undergraduate students may be the condition that could facilitate their learning better. Thus, my colleagues and I have developed the participatory action research project proposed to the Thailand Research Fund (TRF). The overall research question is “how to develop collaboration among university, research-funding agency and local communities so that learning-teaching, researching and community servicing can be integrated so that undergraduate students may be empowered to increase their ability”. Fortunately, the research management project has been granted since May 2002.

DEVELOPING COLLABORATION WITH LOCAL COMMUNITY

The first research question is how can we develop a learning community for undergraduate students?. Under the research management project, we have set up the Center for Community-Based Research, Faculty of Agriculture. The Center’s mission is to facilitate the empowerment of local community people through undertaking community-based research (CBR) projects under the conditions that villagers are researchers who organize the learning process. This requires the participatory formulation of research questions and action plans which includes the action of trial alternative approaches to improve the community situation. Up until now, there are seven CBR projects in Lamphun, Chiang Mai and Chiang Rai province. These CBR communities are expected to constitute a learning community for students.

DEVELOPING COLLABORATION WITH PRACTICAL TRAINING UNIT

The next important research question came is how to enable the Students Affairs Unit and the Practical Training Unit to utilize seven CBR projects as a learning community for undergraduate students?. An opportunity was opened during the First-year practical training in 2003 when 120 second-year students received practical training in five CBR communities, with the support of peer groups from the Center. The Center’s coordinator and staff became the practical training committee who developed the action plan of preparation process, practical training in communities, student’s presentation of outputs, and critical reflection by the training committee. This collaboration allows the Center’s coordinator and staff to learn more on how to facilitate learning of students throughout the practical training process so that students can increase their ability. We have developed a manual for the Center, which will be used and further improved during practical training 2004.

As it was the first time for the Practical Training Unit’s staff to organize the training in local communities, they have also learned how to communicate with stakeholders involved such as undergraduate students, involved Faculty’s staff, the Center’s coordinator and staff, the community-based researchers, village leaders and villagers. Mrs. Saowaluck also drafted a practical training manual for the training in 2004. She has learned how to applied lesson learned from the first practical

training in local communities to improve the action plan of the training in 2004. Subsequently, the Faculty of Agriculture has set a yearly budget for the Unit, which will sustain the system.

Similarly, it was the first time for five local communities to have 20-30 university students for five-day visit. Community-based researchers become the organizers who set up the action plan of training. Youth and children in villages have participated in the process and have closely communicated with students. They learn more from students about studying in university, which has been a dream for some of them. It is interesting to note that some boys and girls have changed their mind to further their study in university instead of at the polytechnic level.

For second-year students, five-days practical training in villages enable them to learn more about local community situations which is different from what they have learned from the lecturer or seen on CD or photos. Their stay in the villagers' home allows them to directly observe the villagers' everyday life. Their worldview has widened through practices, observation, listening and exchanging ideas with the elders, middle-aged villagers, youth and children. Many students were surprised with local wisdom and the capacity of experienced villagers, which contributes to the change of their attitude towards local people. Their comments on what they have learned illustrate their willingness to participate in improving the local community situation by integrating the local wisdom and the modern technology they have learned during study in university.

Facilitating Student's Research Ability through "Special Problem" Research Project

At this stage, our research question was how to develop collaboration between the Center and the Department of Agricultural Extension. In March 2003, the Center's coordinator and staff facilitated the practical training of 30 third-year undergraduate students on an Agricultural Extension Course for 15 days in six CBR communities. It is important to note that they have learned to facilitate the practical training of the second-year students for five days. What they have learned is quite similar to those second-year students. It is important to note that community researchers have increased their ability to manage the "student's practical training" as a tool to further identify what research questions that can be answered by students and Faculty staff. Consequently, the impact of third-year practical training is that 9 students have decided to undertake their research activity as required by the curriculum under the "special problem" subject. Eight students have developed research activities in accordance with the CBR project while one student has developed research activities on her own community. This is the starting point of the collaboration between the Center for Community-Based Research and the Department of Agricultural Extension. Learning from such collaboration, the Department will provide the research financial support for the "special problem" project research by third-year students which will further facilitate the integration of practical training and the special problem project.

DEVELOPING COLLABORATION WITH STUDENT AFFAIRS UNIT

The Center's coordinator has discussed participatory action research with staff of the Student Affairs Unit with the aim of improving the student's capacity. Such discussion was organized in order to answer the research question of how to develop collaboration between the Center and the Student Affairs Unit. In October 2003, the Center's coordinator and staff were facilitated 60 undergraduate students who work for the "Student Assembly" and various student clubs. The aim was to develop vision, mission and action plans for the year 2004. Additionally, the "critical reflection" activity was organized to review the action plan for properly adjustment throughout the year. The workshop to revise action plans for 2005 will be organized in December 2004. It is important to note that the collaboration between the Center for Community-Based Research and the Student Affairs Unit has successfully developed because the Student Affairs Unit staff have observed how the Center empowers students for years. Accordingly, the Unit's staff has utilized the budget more effectively.

DISCUSSION

The research process discussed above illustrates how the collaboration of local communities, university and research-funding agency has gradually developed and how such collaboration

contributes to the empowerment of undergraduate students to increase their ability. It is clearly that the research process starts with the facilitation of community-based research projects in local communities. The research management staff has set up a unit for facilitating the collaboration. Furthermore, concrete community-based research projects can be utilized as a learning community for the second-year and third-year students through practical training. Practical training facilitates the collaboration of the Center and the Practical Training Unit. Consequently, the research questions of CBR projects and communities can be used to enable the third-year students to undertake participatory action research research projects either in the same community or in their own community. With such opportunities, the Department could be encouraged to provide financial support for the students' "special problem" research project. The collaboration can be further developed with units such as Student Affairs Unit by using the expertise of the Center's coordinator and staff.

The collaboration of the CBR projects and communities, Practical Training Unit, the Student Affairs Unit, the Department of Agricultural Extension has contributed to the integration of learning-teaching, researching and community services and such faculty staff as myself. It is important to state that information and knowledge generated by the CBR projects can be used to develop research projects for both undergraduate and master students as discussed earlier. At the same time, community service is built in throughout the research process, once new knowledge is generated and utilized to improve the community situation.

Conditions Contributing to the Development of Collaboration

It is clear that the Center's coordinator and staff have played crucial roles in facilitating the collaboration of involved stakeholders. It is the coordinator's belief and vision that drive her to facilitate such research projects. Similarly, the willingness of the staff of the Practical Training Unit and Student Affairs Unit in improving the working approach is also an important condition that contributes to their participation. Another condition is that the financial support from the Thailand Research Fund to the CBR projects and to the Center helps to translate belief, vision and action plans into practice. On the job training empowers involved stakeholders and helps them to revise their belief, increase knowledge and skills. The willingness of local villagers in welcoming the students is another condition that strengthen the collaboration. It is important to note that the continuous critical reflection among those involved in the research process has greatly helped to develop mutual understanding and belief among stakeholders, which then can sustain the collaboration. Further research question may deal with the sustainability of the collaboration without the financial support of research-funding agency.

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ABSTRACT

The authors describe their research in far north Western Australia, where graduates from an ECU regional program began their careers as teachers in remote schools. The graduates were visited initially in 2001 to determine if living in a remote location would impede their ability to undertake post graduate studies online. At this time it was found that their ability to access internet based courses was very limited.

These potential students were revisited in 2003 to determine what had changed. The authors found that the situation had improved in some cases with the introduction of new ICT infrastructure. The overall ability of students to study online in these remote locations was still restricted compared with their urban counterparts. This is an increasing concern, as universities (ECU included) move towards the electronic distribution of learning materials, shifting away from paper based traditional distance education.

With the globalisation of education new technologies are being used so that students from all around the world can study online using the same materials. While in theory this is true, what is the reality? Universities (and other providers) assume that their students have equal access and opportunities despite their location. But do online students based in Khon Kaen, Halls Creek, Los Angeles, Japan or Perth have equality of access?

In this paper the authors draw attention to these issues of potential inequality. In remote areas poor ICT infrastructure or restricted access is often the norm. Universities and other e learning providers sometimes inadvertently compound this through inappropriate course design and delivery. In addition to the quality of Internet access, assumptions cannot be made about students ICT skills, their proficiency, the availability of hardware and software.

Introduction

Australia is a land of contrasts, at any one time the country can have flood and drought, extreme of heat and cold. While often thought of as a Western country with most people living in a few big cities (Salt 2001). In reality Australia is very multicultural with peoples from all over the world calling Australia home (Collins 1988). With Australia's migration rate being higher than the birth rate (52%) (ABS 2003) this trend is set to continue. While much of the population does live in the South Eastern corner of Australia, many of its isolated population centres are separated by hundreds and in many cases thousands of kilometres of arid land and or unpopulated land. (see Fig 1).

For governments, educators and providers of telecommunications this presents a real problem. How to provide equality of access for all Australians, given a small population (20 million) and a very large country.

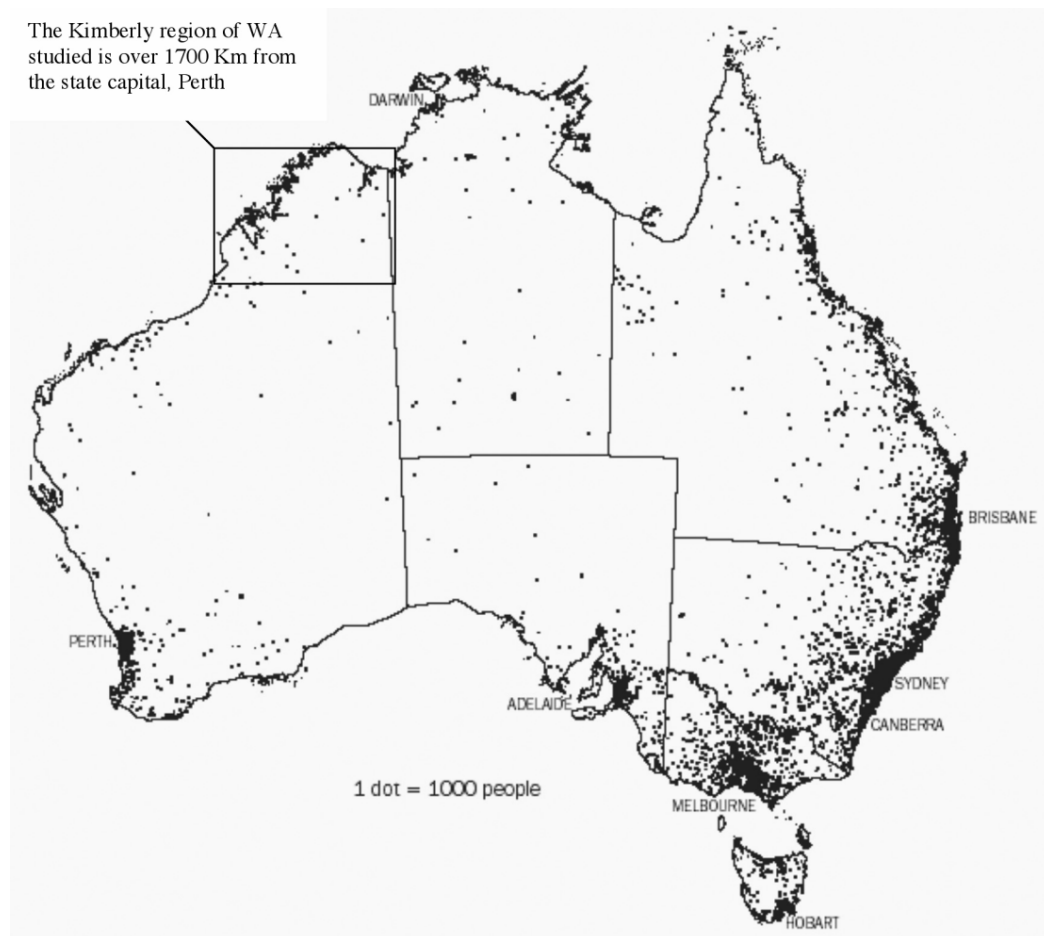


Fig. 1. Australia population distribution 2001 (ABS 2003).

There is a growing awareness that the pedagogy for both oncampus and distance education students continually needs to be reviewed. This is imperative to accommodate the learning styles of the broad range of tertiary students studying with Australian educational institutions both within Australia and overseas. The recognition of diversity among students and their multicultural backgrounds must be taken into account to address different learning patterns (Rabbitt 1999).

As we move into the 21st century, higher education institutions in Australia and around the world are undergoing a transition. The trend is to move away from traditional methods of course presentation towards online methodologies. The common name for these technologies of instruction is e learning. Unfortunately there are as many definitions of this term as there are e learning courses. These range from little more than online study guides to streamed video, chat groups and video conferencing. These later features make the units much more dynamic and are aimed at providing the external student with a learning experience similar to that of the on campus student. In theory, with these new technologies students within isolated and remote areas of Australia and around the world no longer need to relocate to major cities and educational institutions as they have access to learning opportunities online. But on a practical level is this really the case? The author's experiences have shown that two main factors stand in the way of true equality of access. These both are related to the technology itself.

The first is related to pedagogy: Each of the authors has spent over 25 years in Australian Education, and like all teachers, we know that no matter how many times we teach a subject, no two classes are ever taught the same. This is because no two groups of students is ever the same. This is the case between classes at the Perth campus of ECU or in teaching as we have the same subject in South East Asia, the Broome in far north WA and the Seychelles. A teacher adapts his or her teaching style to suit the learning style of the students (Rabbitt 1999). Unfortunately e learning by definition is a one size fits all approach to education and if that disadvantages you because the instructional design does not suit your learning style, bad luck!

The second is related to access: Despite the advancement and access of internet technologies, in these remote locations it is not always the 'norm' for residents to have an internet connection at home or indeed the telephone. In regional north western Australia, although telephone lines are readily available in major towns this is not the case for residents in smaller communities and out of town locations. When this infrastructure problem is combined with the need to have a reasonable ICT skill level to partake in e learning and the socio economic level to be able to afford one and real barriers start to appear (Rabbitt et al 2003). As can be seen in Fig 2 across Australia a smaller percentage of rural households have access to the internet compared to those in the city (Australian Bureau of Statistics 2002).

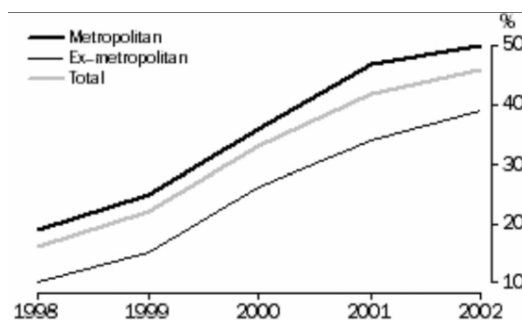


Fig 2 Households with Access To The Internet (ABS 2002)

With Edith Cowan University being based in the largest and most sparsely populated state of Australia, we potentially have some very remote clients indeed. So these issues and their solution is of great interest to us. Over the past five years the authors have been working on a number of small research projects that try to gain insight into an understanding of these problems. This work is ongoing with our current research including the learning styles and opinions of Thai and Singaporean students as well as regional and metropolitan Australian e learning students.

This current paper looks at a longitudinal study on the reliability of and access to ICT technologies in remote schools north Western Australia. It was an investigation into the access and practicalities of on-line learning opportunities for potential ECU students who were working as teachers in two remote government schools, in 2001. The same potential students still working in the North West of WA were re-visited and interviewed in 2003. It was the purpose of this research, with the cooperation of the teachers in the selected schools, to determine the practicality of studying using online materials at these remote locations.

The teachers involved in the study were past graduates from Edith Cowan University who had been the subject of a previous research project. These teachers had, as part of their undergraduate degree, been taught with and how to use a wide variety of online technologies. (Pagram et al., 2000). These students who were in their second year of teaching when first visited in 2001 were potential candidates for Edith Cowan's Master of Education (MEd) online program. In this course the entire MEd by coursework is studied via the Internet.

Teachers' were chosen because in many small remote Western Australian communities the local school has the best connection to the Internet and is the logical location for a tertiary distance education student to go in order to undertake an online unit.

The term communities in this context refer to Aboriginal communities in north Western Australia (Brook, & Oliver 2003). These communities vary in size and in general terms maybe equated to a small village in other parts of the world. Services available in communities vary according to the population size and distance from a township. In north Western Australia it is not unusual for a community to have an office administration building where mail is collected and received and messages can be left for community members. Few homes within the community have their own phone but have electricity and running water. Some communities have an airstrip, general store, medical services and police presence while others do not have any of these services. Communities have to generate their power supply. Fuel and general supplies are transported by road-trains, weather permitting, as access roads are usually not more than a dirt track. All communities have a Chairperson and committee of representatives that makes decisions. Most communities have a school, which becomes the education centre of the community.

Learning styles and distance education

"Distance learning courses which do not have group/collaborative components (and instead rely on telephone calls, e-mails and faxes between instructor and individual students) often are barely more than independent study or "correspondence courses" which are not exemplar of the quality learning experience (Hiltz et al 1999, p. 2).

For many remote students there are no alternatives for study other than the distance education mode, due to isolation, ties to the family, community and land and the sheer expense of relocating The learning style offered to distance education students in remote areas differs from the pedagogy surrounding the modes of study offered by mainstream universities throughout Australia. E learners and other distance students become independent learners devoid of personal human interaction. The depersonalised nature of communication between the external student and their lecturer is exemplified with the use of voice mail, snail mail and email. These methods of communication all impinge upon the student's learning experience and subsequently educational outcomes. Their success or failure swings between the quality of the online materials, the relevance of the course work, the availability of the lecturer and the skills, determination and commitment of the student.

One major difficulty of external course work and e-learning is interpreting the desired outcomes for success. This takes hours of self-disciplined reading to ascertain requirements for a successful completion of the unit. Careful forward planning for the whole semester has to be undertaken. It is imperative that a work programme is devised with realistic goals for weekly success. A calendar of important dates has to be referred to regularly.

At present, there is limited opportunity for distance education students to interact, work cooperatively and communicate with other students in units whereas most units in on-campus mode are workshop-based, emphasize team and group work, and use a variety of assessment modes. In particular, off-campus students have traditionally been denied the “experience of community” available to on-campus students. The distance education student has traditionally only worked on their own or with the limited collaboration offered by email. This means that two students completing the same unit, one in distance education mode and one in on campus mode can have very different learning experiences (Rabbitt 1999).

E learning and culture

While a detailed discussion of the relationship between culture and learning styles is outside the scope of the current paper it is an issue that must be taken into consideration when designing e learning materials. E learning materials are by definition multicultural in deployment in that they can be accessed by anyone anywhere in the world, but in design they are generally mono cultural, designed with a particular group of students in mind. In the case of the teachers involved in this study they were all indigenous Australians who research has shown to have a particular learning style (Rabbitt et al 2001). All ethnic groups have their own style of learning and for many English is a second or foreign language.

Location

The Kimberley Region is Western Australia’s most northern region. Covering an area of 421,451 square kilometers, it is one of Australia’s most isolated and remote areas. In 1998 the Australian Bureau of Statistics (ABS) estimated the Kimberley population to be 27,716. Approximately 46% of the population are Aboriginal or Torres Strait Islander people. There are six towns and around 25 large Aboriginal communities. Broome is the largest town with an estimated population of 10,503 in 1998. During the winter months, from May through to October, the population rises with an influx of a large number of short term visitors, associated with the tourist industry. The three graduate teachers involved in this study were posted to two Aboriginal community schools. All are classified as ‘remote’ as they are thousands of kilometers from the capital city and remote from the nearest large town.

SETTINGS OF THE SCHOOLS

School One

There are three teachers at this primary school, which currently has 33 pre-primary through Year 7 students. The school is 27 kilometers by unsealed road from the nearest town (population: 1300). It is 2,500 kilometers from the state capital and head office administration base. As it is situated within a kilometer of one of Australia’s major river systems, it is not unusual for the community to be flooded during the ‘wet’ season from November through to April. Road access then becomes impassable and community members have to stock up on supplies as there is no operating community store. The major form of communication is the telephone.

On the first visit in 2001 the school’s small Ethernet network is connected to the Internet by means of a router and 56K modem, which connects, via a radio telephone system. This connection was very slow and intermittent, and its speed varied with atmospheric conditions. At the time of visiting the speed appeared to be around 28kbps. The teacher commented that the observed speeds were about average and rarely improved. Consistency of connection was also noted, with the connection speed and existence varying from day to day and hour to hour. This is often due to factors such as fluctuations in the power supply, storms and other atmospheric conditions. Consequently, the teachers noted that the phone is the most reliable and hence preferred method of communication and they don’t always check their email.

Internet connection tests were performed to check the data transmission speeds and the suitability of various Internet-connected devices for use in the distance education context (see Table 1).

The biggest visible change in 2003 was the prominence of an extremely large satellite dish. Within the school itself, there were two visible changes. One being the increased number of MS Windows machines (with a corresponding decline in Apple Macintosh computers) since the last visit and within the office area the addition of a file server and router to facilitate Internet access throughout the school. The school principal was asked about these new additions and his reaction was to laugh. He pointed to a small (domestic sized) satellite dish on the roof of one building. “That is where our internet access really comes from. We’ve never had the big dish working properly” (Teacher Two, personal communication 11th November, 2003).

The school’s bandwidth problems appeared to be solved. However, there is still the question of the reliability of the system. On the day that the researchers visited the school had no internet access and this we were told was typical. As the teacher stated “you cannot plan to use the internet in your lessons because it is a lottery as to whether you will have access at the time or not” (ibid).

From the researcher’s point of view looking at remote access for study purposes it appeared that the situation had improved considerably since 2001. The technology required to study online had in fact arrived at this remote location, although it was not yet reliable enough to ensure the ubiquitous access required for e learning.

Hardware issues

Despite the fact that the computers and equipment were being used in air conditioned classrooms, the overall natural environment is problematic for computer usage. The constant heat, dust, damp and humidity as well as power spikes caused by storms and other power fluctuations take their toll. The life span of the machines is reduced and when hardware fails getting repairs completed is a complex exercise. The machines are freighted down to Perth by road transport for replacement of parts and servicing. “A computer that experienced a surge took one month to be fixed. It was really damaged and it was the principal’s decision to send it away” (Ibid).

School Two

This school is 180 kilometers from the nearest town (population: 12,000). There is only one, unsealed, 13 kilometer road into the community. It is 1,500 kilometers from the state capital and head office administration base. The major form of communication is the telephone. School two is larger than School One, with 160 children. There are 12 teachers plus the principal.

On the first visit in 2001 the school’s single Internet equipped computer was located in the school library. This computer was connected to the Internet by means of a 56K modem which connected via a radio telephone system. This connection was very slow, intermittent and its speed varied with atmospheric conditions. At the time of visiting in 2001 the connection had just been repaired due to cyclone damage. Internet connection tests were performed to check the data transmission speeds and the suitability of various Internet-connected devices for use in the distance education context (see Table 1).

On the visit in 2003 little apparent change seemed to have taken place in School Two. Internet access is still problematic in the community and was not available in any of the classrooms. Teachers at this location still had no access suitable for online learning.

Capability test	School One		School Two	
	2001	2003	2001	2003
Email	Yes	Yes	Yes	Yes

(Send & receive attachment)				
Web Surfing (of ECU Perth)	Slow	Good	Slow	Slow
Server connection (1.2 meg from a US server)	No	Yes	No	No
Video Conferencing (with ECU Perth)	No	No	No	No

Table. 1 Internet Connection Tests

RECOMMENDATIONS

The researchers have a number of recommendations for key stakeholders in the remote education business:

- Stake holders should not assume that because Australia is a developed country, therefore all communities in Australia have equality of access to Information and Communication Technologies.
- Instructional designers and educators should note that with the current trend towards e learning that there is a danger of widening the digital divide between rural, remote and city students.
- It is essential that policy makers address the needs of isolated peoples in terms of providing contemporary infrastructure so as not to alienate less privileged or isolated communities.
- Web site designers need to be aware that connection speeds for e-learners in isolated areas are not necessarily on a par with their city counterparts. Thus web learning resources need to be designed for either a low bandwidth or designed with user-selectable high or low bandwidth versions.
- Policy makers need also to acknowledge that there is limited expertise in isolated areas; therefore there is a need for the infrastructure to be self supporting or easily maintained by users.

•Although the current research took place in outback Western Australia, it is the authors' experience that similar circumstances occur throughout the Australasian region. Further research is needed in order to determine culturally appropriate local solutions to bridge the digital divide between cultures and country and city.

CONCLUSIONS

The teachers in many ways represent the ideal online MEd students. They were highly computer literate and have access to computers with which they are familiar. However none of these students could undertake an online course. The most modest online unit makes use of web based material, made up of a combination textual and pictorial elements, combined with an online bulletin board system. The more sophisticated units add to this, video streaming and interactive multimedia elements as well as synchronous technologies, such as video conferencing. None of these elements was available over the type of Internet connection first found at these schools. On the second visit the first school had a hybrid solution that made use of satellite download and radio modem upload. This type of connection would allow all but the video conferencing to work. However the reliability of this system seemed to be problematic.

As the researchers found it was still possible in late 2003 to find communities in the North West of Western Australia that do not have satisfactory Internet access. At the time of visiting the teachers they still could not study online with any certainty but while it is evident that there are indicators that the situation is improving in the bush the local school still remained a focal point for online communications within the communities visited. This dependence upon the school is likely to continue for the foreseeable future. Internet access is restricted as there are very few landline telephones. As such there is no easy home internet access and no facilities such as internet cafes or other places available.

Isolation brings hidden technological disadvantages such as how to maintain the equipment when the nearest technician maybe thousands of kilometres away. This is not merely a cost issue but one of disadvantage because of the large time delay for repairs to take place. While a standard operating systems (SOE) system helps in many ways to overcome these disadvantages with software failure it brings another problem, that of locking out the simple local fix and causing small problems to become major time consuming ones. The combination of poor Internet access and unreliable technology tends

to be very discouraging not only for classroom teachers when planning their school activities but also for the teacher's confidence when they themselves think about the practicalities of studying for an online degree.

While this study was very small scale and the researchers would hesitate to generalise its findings it is still possible to find places in Australia that have online access more reminiscent of the third than first worlds. With Australian universities pursuing with vigour the new burgeoning 'e education' market and in many cases replacing their more conventional paper based distance education materials with online substitutes. There is a danger in disadvantaging students who study in regional and remote locations including those who study in many overseas countries where Internet access is not necessarily as readily available as in metropolitan Australia.

The researchers' next task is to undertake further research in this area following current Edith Cowan University students studying in metropolitan, regional, remote and overseas locations. The purpose of this will be to add on our understandings of how universities can utilise this technology without disadvantaging some students.

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Pagram, P. Edith Cowan University, Australia. E-Learning in the Thai context: The implications of new learning Technologies on culture and models of learning

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ABSTRACT

E-learning is a very topical much misused term with many countries both developed and developing are rushing to embrace this new educational technology. Perceived benefits in both cost of delivery and educational outcomes are often the driving force.

This has led to a new phase in the globalisation of education, with education being sold on the world market like any other product. With this global trend come issues that go beyond those of content, delivery and even language. E-Learning materials are very expensive to produce so its success largely depends upon economies of scale, this leads to a one size fits all pedagogy. Even locally produced e-learning materials can suffer in this way as often the content is local but the instructional model is international. The result is that often local content is plugged into overseas e-learning templates without the model of instruction being modified to suit the learning style or the culture into which it is being delivered.

Thailand is a country with very unique, strong cultural traditions and her peoples have largely Buddhist religious beliefs. These two factors are interlocked and affect all aspects of Thai life including education. Traditional Thai education has evolved to complement and sustain this unique and diverse culture. Copying e-learning styles from overseas countries may not be suited to Thai students and more importantly is that inappropriate e-learning styles may affect Thai culture through influencing the values of the new generation.

This paper looks at this issue from a Thai perspective. Though the eyes of its author who is Thai, It examines the links between culture and education in Thailand and looks at way Thai students are taught to learn. The possible implications to culture of e-learning materials intended for a world audience are examined. The paper concludes with a look at the author's current researches in this area.

INTRODUCTION

Countries throughout the world are applying the advances in telecommunication and information technology to change the way education is delivered, this global trend is also being felt in Thailand. The Book 'Education in Thailand 2002/2003' (2003, p.84) states that realising the important role of technologies for education is important in enhancing the competitiveness of Thailand and its people in a knowledge-based economy and society. Both the 1997 Constitution of the Kingdom of Thailand and the National Education Act of B.E.2542 (1999) also specify using technology for education. However, Thailand is very unique and different from other countries in many ways and the best way of using ICT in Thai education is not necessary the same as in other countries (especially western countries), because of cultural and historic differences.

The first two computers were brought into Thailand in the reign of King Rama the Ninth in 1964. Since then, the number of computers in Thailand has grown steadily to about 2.3 million in the year 2000. The total of Internet users in Thailand increased from 600,000 in 1998 to 1,600,000 in 2000 and the government plans call for approximately 12 million Thais using the Internet by the year 2006 and 14 million in 2008 (Charmonman, 2001, p.4-5). Email and internet access is cheap and plentiful throughout Thailand, on just about every block in the main cities and resort areas, and even in the smaller towns and villages (O' Reilly, &

Habegger, 2002, p.416). However this must be put into context, the internetworldstats.com web site (<http://www.internetworldstats.com> [2004, June 4]), reports that Thailand has a population of 64,337,900 (2004), and has 6,031,300 Internet Users (2004). This data shows that while the number of internet users in Thailand tripled over the 4 years period, less than 10% of the Thai population have access to the internet. For comparison Australia has a population of 20,226,100 (2004) with 12,975, 828 Internet Users (2004).

E-LEARNING IN THAILAND

E-learning is a much used and misused term, Kurtus (2004) states that e-learning is a catch-all term that covers a wide range of instructional material that can be delivered on a CD-ROM, over the Local Area Network (LAN), or on the Internet. It includes Computer-Based Training (CBT), Web-Based Training (WBT), Electronic Performance Support Systems (EPSS), distance or online learning and online tutorials. In the context of this paper I use the term to refer to Online Learning rather than what appears to be the Thai interpretation which includes web based materials both interactive and static as well as what Western countries would call a form of CAI (Computer Assisted Instruction), making use of internet and proprietary technologies to enable distance education through video broadcasting.

Crichton & LaBont (2003) identify two distinct approaches in relation to e-learning; ‘Asynchronous and Synchronous’ as follows:

Asynchronous learning allows the learner and instructor to communicate about the learning experience at different times. E-mail, online forums, bulletin boards and list serves are some of the tools used in this approach. Synchronous learning is more reflective of traditional face-to-face learning approaches, with the instructor and learner online at the same time. Virtual classrooms and online video conferencing are the tools used for this type of learning approach. (p.1)

At present, most e-learning has been delivered by the WWW (World Wide Web). Tanhikorn (2001) states that the styles of e-learning being used in Thailand at the moment are only Web-Based Instruction, Web Based Interactive Learning Environments, Web-Based Multimedia Presentations. Tanhikorn (2001) goes on to state that e-learning in Thailand is a type of learning which uses asynchronous technologies to learn without limited time and place.

To promote e-learning to Thai society, the National E-learning Centre was authorised by the Council of Ministers in March 2003. The centre provides e-learning and e-training services as a resource for self-study for all learners [children, youth and adult] (Education in Thailand 2002/2003 2003, p.66). At the basic education level, all students in primary and secondary schools are taught in a traditional classroom and teachers use commercial software such as Microsoft Office or CD-ROM based software to support teaching-learning in their classrooms (and to support the content area of ‘Technology-Related Education’), there is a move to e-learning as well. Such as the Distance Learning Foundation (DLF) established a web site ‘www.dlf.ac.th’ as an e-Learning Service in 2002.

For most schools the internet is used as an information resource and a practical technology for teachers and students rather than being used for e-learning pedagogy. One reason is often the poor facilities available for students to use. Ainley, Arthur, Macklin & Rigby (2001, p.19-20) highlighted that although the SchoolNet project involved the establishment and maintenance of telecommunications equipment at 20 online centres in 76 provinces, more than half of all secondary schools still use their computers as stand alone machines, only one third of secondary schools (32 per cent) have a local area network and only a few secondary schools (less than 7 per cent) have a connection to the Internet. Most (63 per cent) primary schools have computers located in a separate computer laboratories rather than in classrooms. Naktup (2002, p.61), when describing the status of technology used in schools, said that the ratio of computers to students in primary schools is 1:84 and in secondary schools is 1:53, that 5.8% of schools can access the Internet (primary level 2%, secondary level 25%), that only 21% of primary schools have a telephone, and there still are 309 primary schools that do not have electricity. So while in theory there are a thousand schools that can access the internet and can search information around the world, there are problems at the classroom level.

One issue that faces Thai educators who wish to make use of e-learning and other internet based materials is that Thailand regards English as a foreign language (rather than as in many S.E. Asian countries a second language). This means that there is less information intended for Thai teachers and students as most of the information is in the English language so it is hard to understand. Also much of the information found on foreign websites is non educational and might influence Thai children with the negative aspects of foreign culture as discriminating between good and bad information delivered via web searches for example is compounded by the language barrier. This is emphasised by <http://glreach.com/globstats> [2004, May 20], which states that only 1.4% of web sites are in the Thai language compared with 36% in English. Thai government has recognised this and established “Digital Library for SchoolNet (2004)” in the Thai language to help solve these problems.

Within higher education, many of the Thai universities that are introducing e-learning programmes are developing asynchronous (LMS) learning management systems. However, the majority of the 75 Thai university websites are currently being used for informative purposes only and during 2002-2003, only 13 universities were using e-learning as the web-based pedagogy (Intrapairote & Srivihok, 2003).

While the e-learning pedagogy being implemented in Thailand tends to be the Asynchronous approach this focuses upon content delivery, the important cultural aspects of education require a synchronous approach, as Motteram (2001, p.131) stated “Synchronous tools are more effective for the 'social' side of education and the asynchronous tools are better at dealing with the 'academic' aspects of the course”.

THAI CULTURE LEARNING STYLES AND PEDAGOGY

Hofstede (2001, p.10) stated that ‘Culture could be defined as the interactive aggregate of common characteristics that influence a human group’s response to its environment. Culture determines the uniqueness of a human group in the same way personality determines the uniqueness of an individual. Moreover, the two interact: Culture and Personality is a classic name for psychological anthropology’. It can be said that Thai personality and behaviour are strongly influenced by both family and society. Culture includes art, religion and traditions, it is the unique symbol of the nation and also appears in language and behaviour so that when Thai people see each other, they can tell that they are Thai at first sight.

Contemporary Thailand is largely a, mono-culture and mono-religion country (95% of Thai are Buddhist) and the national curriculum addresses students’ human rights, morals and ethics. This is to ensure that national development will be in line with the Thai way of life and Thai culture. The Thai government has long realised that education is the best way to maintain and promote Thai culture. Therefore, a major aim of education is to aid the process of human development, so that learners can learn and develop for themselves and their society.

As the National Education Act of B.E.2542 (1999) indicates in section 23 and 27 of the ‘National Education Guidelines’ that

Education through formal, non-formal, and informal approaches shall give emphases to knowledge, morality, learning process and integration of knowledge such as knowledge about oneself and the relationship between oneself and society namely: family, community, nation and world community,... knowledge about religion, art, culture sports, Thai wisdom and the application or wisdom (section 23)...and ...for purpose of preserving Thai identity; good citizenship; desirable way of life; livelihood...(section 27). (p.11-12)

It can be said that education is the process of cultural indoctrination. As a result, culture is a part of education. In Thai culture, young children are taught early to show respect for those older than themselves. For example, younger children cannot call their older siblings by their names; they must use the title ‘pee chai’ (big brother) or ‘pee sao’ (big sister). It is impolite not to use these titles. Using familiar titles such as ‘pa,na’ (aunt), ‘loong,arr’ (uncle) or ‘pee’ (big brother/big sister) is also required

when speaking with older people. This family-like feeling among unrelated people is found in both domestic and work settings throughout Thailand. A very important part of Thai culture is the 'wai', a gesture used to show respect to those older or in positions of power. It is a slight bow of the head accompanied by pressing the palms of the hands together and raising them in front of the chin. Instead of shaking hands, Thai people 'wai' when meeting or saying good-bye. Children 'wai' to parents, grandparents and also the old (Cherry, 2000, p.22-23). As a result, Thai children have different attitudes, values and behaviours to western children. They are social learners. They learn in a group and have a very close relationship with friends in their villages and classrooms.

Throughout life, motivation and beliefs play important roles in learning. The social dimensions of learning are significant. The contributions of groups and networks to individual and community learning are well documented, including their role as powerful shapers of beliefs, as motivators, and as audiences for reflection on one's understandings and learning. Physical meetings and dialogue are central to support learning in communities and for individuals. There are cultural and individual characteristics that shape preferred learning styles (Ainley, Authur, Macklin & Rigby, 2001, p.53). Hofstede (2001) indicated that Thai national culture was characterised by high power distance (p.87), high uncertainty avoidance (p.151) low individualism (p.215) and low masculinity (p.286). Thus, Thai culture helps form Thai students' attitudes and behaviours to be generally passive in nature. Thai students tend to have the similar learning styles and need a lot of guidance from teachers even in higher education. They are familiar with social learning more than individual. The Master theses of online education students in Sukhothai Thammathirat Open University has shown that students need more communication, encouragement and looking after from a supervisor (Boondao, 2003). Malaiwong (1997, p.51) commented that the serious problem that Thai education has to face for both Thai children and adult students is they have never been taught to learn by themselves. Thai education is a social constructivist education and students have not experience at learning in a constructivist paradigm. This is supported by my own observations as a Thai educator of 23 years experience, students will only study a book that was lectured because most of examination questions are there, but show little application of the knowledge learned.

Thai students are more familiar with group learning and getting their instruction from a lecturer rather than learning by themselves. The strong relationship that Thais' have as a social group starts with the behaviour that children learn from their families and local community. Thai culture helps in the production of largely passive attitudes and behaviours among students. This forms the basis of their behaviour on entering school. Schools are thought of as the second home and teachers the second parents to Thai children therefore commanding a lot of respect. This applies not only to Thai students as Park (2000, p. 246) reported, the learning style preferences of Southeast Asian students, is that students tend to be passive and nonverbal in class. They rarely initiate class discussions until they are called on. This is because reticence and humility are highly valued Asian cultural values. Students do not want to show off what they know, but are also worry of potentially 'loosing face' if their answers are incorrect. Students usually listen to a teacher's lecture, take notes copiously, and answer teachers' questions. As a result, while ICT can help teaching and learning, the design of e-learning must take into account existing learning styles and pedagogies.

DISCUSSION AND CONCLUSIONS

In undertaking an extended examination of the issue of e-learning within Thai context a number of separate but related issues emerge. Globally E-learning has the repute of education for 'anyone, anywhere and anytime' but in reality, this is not yet the case for Thailand. In adopting from the West this new educational technology, Thailand should look seriously to its real educational potential (not just a desire to have e-learning because it sounds modern and important) and be aware of its dangers and limitations, while looking forward at the same time.

Culture and learning style

The asynchronous delivery of e-learning may be suited for providing 'content' but it does not support or reinforce Thai cultural values. This e-learning style can not teach the main expected learning outcomes of physical and mental health, intellect [IQ and EQ], morality, integrity, harmony with

other people [family, community, nation], preserving Thai identity, good citizenship, desirable way of life etc. These outcomes need engagement and social interaction with teachers and friends in practical settings. This e-learning delivery may be best suited to students in higher education as they should have sufficient fundamental knowledge of culture, or for adults in 'non-formal education' or 'informal education' allowing lifelong learners to learn by themselves. It is less suitable for the young who are still developing their cultural values.

The individualist nature of e-learning as copied from the West and as inherent in most Learning Management Systems (such as Blackboard, Web CT, Topclass etc.) disadvantages social learners such as Thai. This is a difficult problem to overcome using asynchronous delivery technologies. The 'synchronous delivery', of e-learning would appear to overcome this problem, however, implementing synchronous delivery is complex and dynamic (Harasim, 2001). It has major problems both in implementation (students, and tutors needing to be online at the same time) and infrastructure (broadband access is needed).

The best solution at present may be asynchronous supported by face to face, as Alhabshi (2003) reported about providing e-learning at Universiti Tun Abdul Razak (UNITAR), Malaysia. "That the face-to-face meetings are important, especially for those coming straight from high schools, as a means of building confidence and for those who are still sceptical of the e-learning mode."

Language

Another important factor which is concerned with e-learning is the English language. The Thai language is used in schools and universities as the official language. All other languages are foreign languages, and the English language is rarely used in daily life except in international institutions or business. Therefore, facing English on a website or in any software programme can cause a problem for Thai students. English is a problem not only in Thailand but in some other Asian countries too. Son (2001, p.356) found in his research on distance education in Vietnam, that language barriers hamper students' use of the Internet. A user needs a certain level of proficiency in the English language in order to log onto Web sites, participate in chat rooms and forums, and generally benefit from the enormous information resources of the Internet. Jitgarun, Thaveesin, Neanchaleay, Suksakulchai, & Puthaserenee, (2003) found that there were 14 major factors that affected e-Learning success of students at public universities in the Bangkok metropolitan area, including; the speed of the network; the students' readiness, feeling and interest in lessons; personal status, social value and the acceptance of innovation; supporting self-learning; finding out knowledge and enhancing English language. Boondao (2003) also found that English was a problem in her masters study. She researched the views of students on online learning at Sukhothai Thammathirat Open University. The biggest problem for students was the reading of English documents and writing an English proposal. The second was web surfing and finding research or documents related to their thesis. This means Thai students need a great deal of English language support from educational institutions as well as facilities.

Infrastructure

There are currently four important telecommunication networks: basic telephone and ISDN network, satellite systems, underwater cable systems to other countries and the cellular phone network. Service in rural areas is still a problem and most Internet service providers are located in Bangkok (Ainley, Arthur, Macklin & Rigby, 2001, p.20). Chuwasettakul (2003) states that approximately 7-10% of families have computers at home, 12% have home phones, 1 public phone per 100 people, 20% have a mobile phone. There are 3% of families that can access the internet (16% in Bangkok, 5% in the central provinces), and 10% access via internet café. While approximately 18.2 in 1,000 of Thailand's population have a PC, it is likely that students from low socio-economic status and other financially disadvantaged groups will have less access to computers in the home than other groups (Ainley, Arthur, Macklin, & Rigby, 2001, p.61).

Ainley, Arthur, Macklin & Rigby (2001, p.53) also reported that although many individuals have facilities at home that can be powerful tools for lifelong learning, unfortunately, the access to those

tools – such as television sets, VCRs/VCDs, radios, and computers with Internet connections – is not evenly spread through society. Furthermore, access to the technical facilities for learning does not guarantee that lifelong learners are both aware of learning opportunities that are available – with and without the technology – and have the capabilities to use them effectively and efficiently (Ainley, Arthur, Macklin & Rigby, 2001, p.53). The implication of this is that Western models of e-learning where students sit at home studying online at their convenience is not yet practical for a great deal of the Thai population who rely upon campus (or internet café) based computers for e-learning access. Thus, losing one of the main advantages for the student of e-learning.

THE AUTHOR'S CURRENT RESEARCH

From my review of the literature relating to Thai curricula, culture and the technologies of e-learning, there is limited information and research about e-learning in the Thai context. While the promotion of computer technologies into the education system and society is increasing, there is no research that has been undertaken in Thailand to examine the effect of e-learning on Thai culture.

By examining an e-learning pedagogy from the viewpoint of key stakeholders of Thai education such as teachers/lecturers, administrators, technicians, parents, society's representatives (leaders/monks), it is hoped to be able to produce a set of guiding principles for Thai educators to follow in implementing e-learning without harming Thailand's most valuable assets, its people and their unique culture.

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Expanding Horizons: Student Views on Internationalisation of the Curriculum

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Abstract

Internationalisation has become an increasingly important issue for Australian universities, with a continued growth in international students over the last five years. This trend has also been reflected at Edith Cowan University, where there are now around 3,500 international students from 84 countries, approximately 17% of the total student population. Whilst researchers have debated issues related to the philosophy and implications of internationalisation, and gathered data on how to attract more students, little has been done to determine the views of both local and international students as they face the challenges and consequences of this policy. The purpose of this research was to investigate the perceptions of local, as well as international students studying at ECU on internationalisation, to inform the debate. To achieve this, students' understandings of internationalisation and their requirements for transferable qualifications, international content in courses, and international experience and opportunities were examined. In the first stage of the research, twenty-five students participated in three focus groups. The participants were from a range of different backgrounds and were comprised of both undergraduate and postgraduate students. After analysis of the main themes a questionnaire was constructed and distributed to three hundred students in the Faculty of Computing and Health Sciences. There were 195 responses from Australian students. The results of this research with local students highlights a range of important factors linked to local student perspectives on internationalisation. In terms of their future, they view internationalisation from a very similar point of view to those expressed by international students, but from the background of an Australian experience. Following discussion of the results, the paper highlights some important considerations for both structural and cultural change to support a positive internationalisation experience for both the local and international students.

Introduction

In 1997, Bradley reflected on whether the debate on the pace of internationalisation and its consequences were causing the implementation of this process to falter (p.3). In retrospect it is very clear that this was not the case. Internationalisation has become an increasingly important issue for Australian universities, with a continued growth in international students over the last five years. This trend has also been reflected at Edith Cowan University (ECU), where there are now around 3,500 international students from 84 countries, approximately 17% of the total student population. Whilst researchers have generally debated issues related to either the philosophy and implications of internationalisation, or gathered data on how to attract more students, little has been done to determine the views of both local and international students as they face the challenges and consequences of this policy. The purpose of this research was to investigate the perceptions of local, as well as international students studying at ECU, on internationalisation, and its impact, to inform the debate.

Background

International students, as opposed to domestic students, are defined as those who are not permanent residents of Australia, but reside on a temporary entry permit, or are diplomats or their dependents (www.dest.gov.au/research/publications/research_notes/2.htm). From 1997 to 2002 the growth in the numbers of international students choosing to study in Australia was a massive 123%, while the growth in domestic students was 8% over the same period. By 2002 18% of the students in higher education were from overseas. This is continuing to increase at a rapid rate.

In 1999 there were 83,999 international students in Australia (Dobson & Holtta, 2001). Four years later in 2003, the International student enrolments were 303,324. The largest change in this period was the upsurge in Indian students choosing to study in Australia. This number grew to 14,386, a 26.6% increase from 2002. China, which already had the greatest number of students studying in Australia, increased by 20.1%, to 57,579 students in the same twelve month period. Nine of the top ten source countries of international students have a first language other than English, and the largest cohorts, aside from China and India, were from Hong Kong, South Korea, Malaysia and Thailand

Of the total students 136,252 were recorded as studying at university. This was a continuation of the upward trend, with a 16.5% increase from 2002 to 2003 (<http://aei.dest.gov.au/AEI/MIP/Statistics/StudentEnrolmentAndVisaStatistics/Recent.htm>). However, not all of the students studying at Australian universities were resident in the country. Around a third of the international students who chose to study at Australian universities remained in their home country, with approximately 66% residing in Australia.

These statistics, highlighting the enormous increase in students, may be one consequence of the increasing focus on commercialisation. However, the literature indicates that, as yet, the meaning and implications of internationalisation have not been clearly defined or understood. Indeed it has been asserted that it has different interpretations even within institutions (Leask, 2002). Some are discussing internationalisation when referring to changes to the curricula, others are reflecting on internationalisation as a means to multicultural cohesion or shared values and understanding. It can also be viewed as a commercialisation process and a strategy to increasing economic viability (Edwards & Edwards, 2001). In fact, it has recently been claimed that 'a global industry has been created' (Mazzarol & Soiutar, 2002, p. 82).

Similar ideas were also espoused by Crowther et al., (2000) who stated that a range of pressures emanating from globalisation are spilling over to the education sector. One of these is 'fierce economic competition' (p.10) for the international student. Indeed there is some evidence of the emergence of a dominant paradigm with a discourse that implicitly infers that international students are a commodity to be sought after in ever increasing numbers. This is reflected in the commercially focussed discourse around the marketing of courses to international students, and the investigation of factors influencing student choice in deciding their country of study. In one example, Milton-Smith (2001) conducted some focus groups to evaluate the success of Australian marketing overseas.

Despite what he viewed as intensive marketing, Milton-Smith (2001) asserted that Australian universities tend to be seen as economically driven and relatively mediocre in their standards. Although his research was based on the responses of few participants, he also claimed that Australia had limited success in attracting international students. In particular, he highlighted the problems in Singapore, one of our nearest neighbours. It is known that Singaporeans are pragmatic, and are likely to consider universities that are reasonably priced, considered safe, and close to home. This should give Australian universities an advantage, but Milton-Smith found that his participants rated Australia as only their fourth choice. This was behind the UK, the USA and their home country universities.

There seemed to be little knowledge of the range of Australian universities, and what they had to offer, amongst the participants. He argued that this was partly due to an uncoordinated national branding strategy, resulting from a lack of political support, and poorly targeted ad hoc marketing. It was speculated that there were other lost opportunities for expansion and improved recognition, such as the

potential to develop high profile Singaporean partnerships and visible academic activity, both of which could help to bolster our reputation and credibility in the region (Milton-Smith, 2001).

However, others have recently found Australia to be very successful in attracting international students. In a UK study exploring the factors that influenced international students in their choice of university, statistics highlighted the strong positioning of Australia in recent years in the international market (Binsardi & Ekwulugo, 2003). With a 15% growth in international student enrolment in 2000, Australia was ahead of both the USA and the UK. The UK researchers attributed this increase to “the aggressive marketing strategies of the USA and Australia in the international markets for education” (p.318). Following the theme of commercialisation and commodification, Binsardi and Ekwulugo (2003) discussed ways to increase the UK market share and ‘market penetration’ (p.318).

They argued that the UK must take a student centred approach, and understand the student perspective on their university choices. Binsardi and Ekwulugo (2003) surveyed 62 international students, who were asked why they were studying in the UK, where they would choose to study if not the UK, and where students got their information when making their choice of country of study. Interestingly, 60% of students indicated that the USA was their first country of choice, followed by Australia. However, a majority of the students intimated that low fees and opportunities for scholarships were an important consideration. These were followed by good support services, collegial networks and better infrastructure such as library and IT access. In terms of promotion, the students viewed alumni links, and the favourable opinion of their family and friends, as the most influential factors in their decision.

Using a similar approach with a much larger sample, Mazzarol, Soutar and Sim Yaw Seng (2002) reported on a survey of 2,485 international students from Taiwan, India, China and Indonesia. Many of these were surveyed in their country of origin on a range of factors that may affect their choice of university. Comparable influences were identified, as well as a range of others, including the reputation of the host country, the quality of the course and the portability and recognition of their qualifications. The reputation of the university and the importance of word-of-mouth recommendations were again very important to the decision of students.

Concurrent to the apparent commodification of international students that underpins the studies outlined above, there is a philosophical debate scattered throughout the literature on what form internationalisation should take. Bretag (2003), for example, expressed concern about internationalisation and globalisation being seen as one process. She proposed that while the internationalisation of education is inevitable, and desirable, it should be mutually enriching. However, she postulated that internationalisation in universities thus far has been more aligned to globalisation. This has included a process underpinned by the socialisation of international students to the dominant paradigms that are embedded in western societies, rather than a reciprocal exchange of cultures, values, and sharing of resources. To reflect this goal, she suggested internationalisation should be accompanied by changes to the curricula and educational principles and practices.

In attempting to investigate the needs and wants of international students at La Trobe University, East (2000) analysed findings from 44 questionnaires, conducted discussion groups with 39 students, and interviewed 10 students in more depth. In contrast to student responses in other studies, it appeared from this research that the international students had limited knowledge of the university before commencing their course, and their decision had mainly relied on the responsiveness and professionalism of their local agent or representative.

Some ambivalence was found in relation to the teaching experience, with an expressed need for more consideration by teachers for the educational improvement of individual students. The students suggested ways this could be achieved, such as teachers being more inclusive in class discussion, and providing more rigorous and meaningful activities in the classroom setting. Despite these assertions, international students claimed they did appreciate and understand the need for self-directed learning, and the requirement to adapt to Australian educational norms and mores. Many expressed regret or discontent that they had little social engagement with the local students. Clearly, some difficulties with

the English language were seen as contributing to their educational experiences and social frustrations, and this was highlighted as a problem requiring further consideration (East, 2000).

The problem of poor social interaction between international and local students was also highlighted by Leask (2002). She went so far as to suggest that low social contact may impede the goals of internationalisation for the institutions, as well as create disappointment and isolation for the international students. She noted that multicultural social interaction was unlikely to happen simply because the students were together on campus, but required a range of structural changes to facilitate the process.

As well as providing a quality teaching and learning academic experience, ECU aims to provide all students with 'a fulfilling, collegial and developmental experience that facilitates social life, welfare, health and safety' (ECU, 2003, p.) In addition to these aims for all students, ECU's definition of Internationalisation is 'the process of integrating an international intercultural dimension into the teaching, research and service functions of the Institution'.

The integration of these aims into the culture and day to day business of the university is gradually being addressed through a range of initiatives. To accommodate an increasing population of international students, some of these will need additional targeted organisational interventions at both the macro and micro level. Further initiatives may include policy review and new administrative systems, whilst academically, review of the curricula will require some thought and discussion. Other changes may arise from the need to give more recognition and support for the cultural norms mores and customs of the students, and importantly, their ability to comprehend the English language.

At ECU, locally gathered information on what is required has been seen as necessary to inform future action. As noted by Dest, the increasing rate of international students highlights the need for more research into the profile of the students, what they are studying, and what their needs may be (www.dest.gov.au/research/publications/research_notes/2.htm). Furthermore, it was considered important to explore the thoughts and ideas of local students, as well as international students.

Aim

The main aim of this research was to increase the awareness of internationalisation amongst students and staff, providing staff with sufficient data to make informed decisions about the student perceptions of internationalisation of the curriculum, and provide the university with relevant information to inform future policies/strategies. To achieve this, students' understandings of internationalisation and students' requirements for transferable qualifications, international content in courses, and international experience and opportunities were investigated.

Method

The preliminary planning of a study is an important first stage in the overall process leading to the main investigation (Patton, 1990). Several meetings and discussions amongst the project leaders led to a decision that the project would involve data collection by questionnaire to gain information in a systematic and structured manner. While a questionnaire is a very useful tool in research, its development takes time and requires careful thought, ongoing consultation and testing. For the initial stage of the consultation process, focus groups were used to obtain qualitative information on student perceptions of internationalisation. It was considered this would inform the questionnaire construction, and enrich the understanding of the research team of the range of student perspectives.

For the focus groups, participating students were recruited from three Schools to discuss the issues of internationalisation using a semi-structured format. All participants who agreed to participate were included, consisting mainly of small groups of postgraduate and undergraduate students nearing the completion of their degree programmes. The Schools from which students were drawn were nursing and public health, information technology, and sports and biological sciences.

Twenty-five students participated in three focus groups. The participants were from a range of different backgrounds. They were comprised of both undergraduate and postgraduate students. Twelve were native born Australian students, whilst the others were from a range of countries including China, Hong Kong, India, Canada, USA, Norway and Yugoslavia. Several were mature aged students (2 males in their 50's, one female 40's) and several had spent time overseas during their PhD studies. Thirteen were male and the remainder were females.

The group discussions were facilitated by an independent administrator as well as leaders of the project, and then transcribed. The questions used to structure the discussion were:
What does Internationalisation mean for you?
What issues does it raise for you?
What are the implications of Internationalisation?

The material was analysed for core themes to form the basis of the questionnaire and after further consultation with the research team a questionnaire was developed. The questionnaire was then piloted with several undergraduate students from each School. Finally, the questionnaire was distributed to three hundred students in the Faculty. There were 195 responses from Australian students.

Results of Focus Groups

Students thought overall that internationalisation was an advantage. Nursing students perceived that it would lead to standardisation, that is, similar standards in terms of health care etc from country to country (international accreditation). Some highlighted that overseas nursing students can learn good standards here to apply in their own countries. They believed that this would be an improvement for some third world countries. Students from other Schools and disciplines expressed similar thoughts on this, seeing some benefit in standardising learning and standardised courses internationally. Furthermore, they indicated that it would lead to sharing information, facilities and research. Combining knowledge would result in less duplicate effort globally, and would be more effective and efficient.

However, there was also some concern over the countries with which collaboration would occur, and from which international examples and standards would be taken. Who would set standards? And what would those standards be based upon? For example, they queried whether the main influence would emanate from Australia, New Zealand, the United Kingdom, the United States and other westernised countries, or whether other countries would also be represented in the curricula. There was some discussion as to whether there would be a central body that controlled all university degrees, and where that central body may be located.

There was some cynicism around the commercialisation of education. Similar to the concerns expressed by Bretag (2003) some students queried whether and how internationalisation actually differs from globalisation, and all the connotations associated with globalisation. Linked to this, they questioned the commercial implications, and whether it would be like a commercial company 'going in and imposing its standards and practices on another country/university'. However, being pragmatic, they noted that it does coincide with economic globalisation, and saw some benefits. An interesting point was that one group mentioned it as potentially the opposite of a 'brain drain', in that students may opt to stay here and share skills learnt here instead of returning to their home country. One NESB student noted that being placed with groups of Australian students was very useful and helped her learn the language. She stated that although she was inclined to talk in her own language when with others from same country of origin, she was forced to use the local social discourse when required to work with Australian students.

However, in terms of the consequences of internationalisation, the mix of students also identified a range of potential negative impacts. Some saw that it was hard for the international students to adapt in many ways. Issues related to the language barrier, religious differences, and culture shock, particularly from third world countries, were discussed. One example was the use of cultural dress during practica, and the acceptability and practicality of this not only in the university, but in the broader community.

This led to the topic of racial discrimination, and whether this was exacerbated by closer observation and the influences of different cultural practices, or whether it actually contributed to more racial tolerance. Several students highlighted that although Australia is multicultural it is not multilingual. There were some comments that language difficulties can be stressful or even cause tension in the classroom, as well as in the broader society.

Students were also very cognisant of some other issues related to academic standards that require further consideration. These related to different years of school attendance prior to commencing undergraduate or postgraduate programs. Furthermore, they considered that it was important that educational background had been assessed for ECU, and where necessary students were offered suitable preparation. This was thought to be a particular issue in student exchange programs when some students may have different curriculum in their first year of university in their home country.

Results of Survey

The survey was conducted in the first week of semester 2, 2004 in the Schools of Nursing and Public Health, Computer and Information Science, Natural Sciences and Biomedical and Sports Science, in the Faculty of Computing, Health and Science. The part of the survey reported in this paper was concerned with what local 'Australian' students perceived internationalisation to be and what it meant to them. 'Australian' students were thus classified as students who were either born in Australia, students who had spent a major part of their life in Australia or students who had worked in Australia prior to embarking in studies.

Of 195 students, 92% were undergraduate students typically in their final year. Graduating students were considered better for the purposes of this survey since they would have had some experience of university life and thus have some informed opinion about internationalisation. 95% of surveyed students were full time and in terms of age 131 were between 18-25 (not surprisingly), 36 were between 26 and 32, 24 between 33 and 40 and 32 were over 40. While these statistics are not an exact match of the demographics of student profiles within the Faculty, the researchers felt that the statistics were a reasonable representation of students.

75% of all 'Australian' students in this sample were born in Australia and 92% had spent a major part of their lives in Australia. Where students were not born in Australia, the vast majority came from England, Scotland, New Zealand or South Africa. The average time students had spent in tertiary study was 3.5 years. Interestingly, the average time students had spent working was 9 years, and if they had worked abroad the average time in work overseas was 5 years. These high figures come from the nursing cohort, where working while studying is common, and where many student nurses are comparatively mature. Study and work experience was much lower in the other Schools.

Students were then asked what internationalisation meant to them. They were supplied with five possible answers and were permitted to tick as many as they wished. In addition they were able to add any additional responses. Figure 1 shows the results. In terms of additional comments, there were 7 responses regarding inter-cultural learning and 5 regarding employment opportunities. They were then asked to prioritise which of these responses they would wish ECU to resource or assist with and why. The highest response (by far) was for ECU to assist in obtaining international recognition of their qualifications (column 2 in figure 1). Here 128 students responded that this would bring opportunities to work overseas. The next priority stated by 82 students was for more exchange opportunities, followed by 66 students who wanted ECU to assist in standardisation of the curriculum.

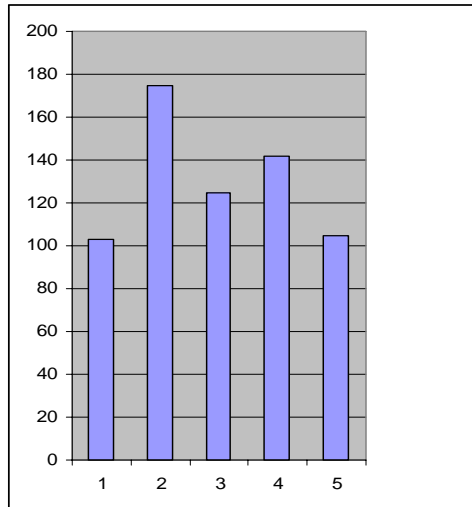


Figure 1 – What ‘internationalisation’ means to students

Legend: Shows number of students (out of 195) responding to:

- 1: Talking to students from other countries
- 2: International recognition of qualifications
- 3: Standardisation of the curriculum
- 4: Opportunities to go on Exchange programs
- 5: International examples in curricula

The next question asked students about what international content they would like to have in their courses as opposed to the concept of ‘internationalisation’. Of the 129 responses 61 related to the benefits of global knowledge. The range of specific responses here included international perspectives, issues and case studies, global research and cross-national comparisons and differences. The next most popular response was 35 students who stated that the content of their course should specifically open up international opportunities for work, study or exchange. The students were then asked what they felt about the international content they have in their courses. Of the 189 responses, 67 felt they had sufficient international content with a further 47 stating that while they did have some content it was insufficient or minimal. Thirty-three replied that they did not have international content in their courses; 8 were unsure. One qualitative comment that appeared in some responses was that much of the international content was heavily Americanised.

This was followed by a question about what Australian content students would like to see in their courses. Of the 133 responses, 40 had an expectation that courses ought to provide facts, statistics or general information regarding Australia and an additional 13 felt that Australian based case studies were important. A further 14 (mostly nurses) were interested in aboriginal health related information. Interestingly, 24 of the 133 responses were related to Australian information that could help in obtaining employment opportunities.

The next question asked if students anticipated using their qualifications overseas. As can be seen from figure 2, the overwhelming majority felt yes, with only 26 responding no.

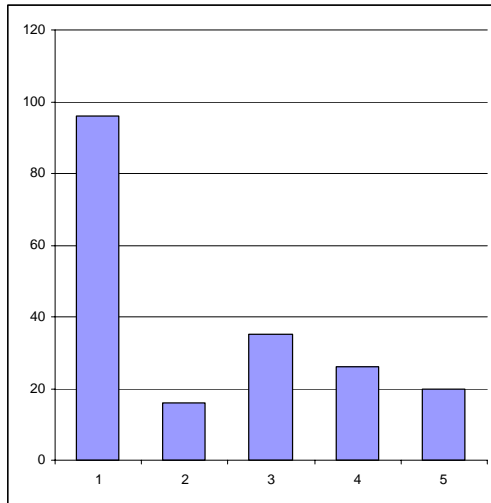


Figure 2 - Do you anticipate using your qualifications in another country?

- Legend:
- 1: Yes
 - 2: Yes in a few years
 - 3: Maybe
 - 4: No
 - 5: No response

Yet when it came to being asked whether students were looking for an international experience as part of their course only about half responded affirmatively (figure 3).

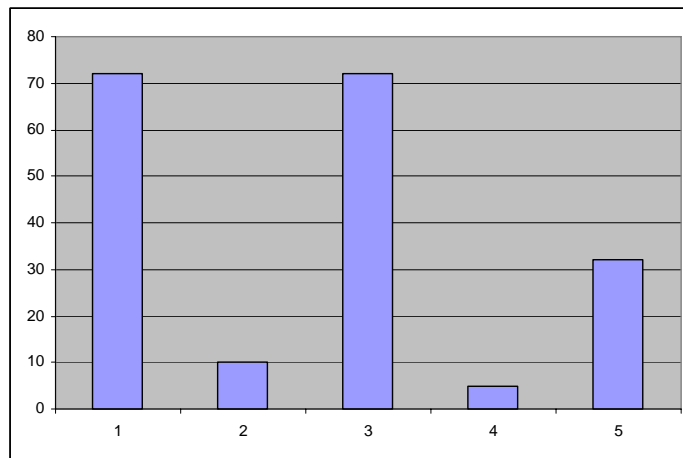


Figure 3 – Are you looking for ‘international’ experience as part of your course?

- Legend:
- 1: Yes
 - 2: Maybe
 - 3: No
 - 4: Not in course but for work yes
 - 5: No response

On a scale of 0 to 5, students were asked to rate to what extent they took part in international activities at ECU. Their average rating was 1.9. Nevertheless, when asked about how they did this, of the 54 responses 31 of the answers were that students did this through having international friends.

These students were then asked why they thought students from other countries came to ECU. Of the 155 responses, 41 felt that international recognition and the quality of courses (especially in nursing and IT) were the main reason. Other notable responses included 18 who said ease of entry, 12 who felt it was a good opportunity generally, 10 who felt that studying overseas was a good opportunity for them, 9 mentioned getting an Australian qualification, 9 stated cost and 9 felt that Australia was a relaxed place to study.

Students were then asked what ECU does well with respect to internationalisation. The 108 responses were wide ranging with no single aspect perceived as distinctive. In general students were quite positive about what the university offers. Examples of good practice included exchange programs, multicultural events, the student village and the international student office.

The last question asked about what improvements ECU could make with respect to internationalisation. Of the 82 responses, 23 students replied that they did not know, which seems to indicate either a level of satisfaction, or a lack of understanding of what could be done, with respect to this question. Other responses included 13 who felt that more could be done to publicise our efforts and 12 who believed that more exchange programs (throughout Australia as well as overseas) would benefit them.

Discussion

The results of this research highlight a range of important factors linked to local student perspectives on internationalisation. In terms of their future, they view internationalisation from a very similar point of view to those expressed by international students, but from the background of an Australian experience. Similar to international students their opinions are underpinned by what they perceive as the impact of internationalisation on their own vocational prospects. Many expect that internationalisation will ultimately bring overseas vocational opportunities for them, as well as the international students.

More than 80% of the students hope, or intend, to work overseas in the foreseeable future. From their perspective it is very important that their degree course has credibility in the international arena. They were very keen that ECU ensure their qualifications are internationally recognised. The standard of their course and education were therefore seen as very important. They also thought that internationalisation may ultimately mean common standards and possibly similar curricula in various disciplines across the international spectrum. Some perceived this to be imperative because they were nurses intending to work on International Aid Programs, and thought they would find more acceptance of Australian standards of health and procedures. Others thought common standards may mean better working conditions and financial reward internationally.

Another expectation of internationalisation for the local student was the opportunity for travel and the possibility of exchange programs being developed for them, similar to those for students visiting ECU from other countries. Some nursing students, for example, speculated on opportunities to go to Thailand or other countries during their nursing degree, which they viewed as being a very positive experience.

A further benefit that Australian students perceived from internationalisation was the opportunity to meet students from other cultures and societies. However, only approximately 15% of the local students stated that they had international friends. Other students said they enjoyed hearing the experiences of international students, but this comment often appeared to be mainly in the context of the classroom, and the learning experience. As highlighted by Leask (2002), it is improbable that social contact will occur to the levels that international students hope for, without a recognition of the institutions that a range of structural changes are required to facilitate the process.

Importantly, students felt that internationalisation of the curricula was very relevant to their future. They felt their courses needed to include a range of opportunities to appreciate international perspectives, work norms and practices. Australian students stated that they would like more opportunities to develop global knowledge through international case studies, and exposure to global research. They also wanted more discussion and examples of cross-national comparisons and differences. Interestingly, a key consideration in giving this response was again related to their own prospects for opportunities to travel and employment overseas. Approximately 28% of those who responded considered that the content of their course should specifically open up international opportunities for work, study or exchange.

Approximately one third of the respondents felt they had a reasonable amount of international content. However, the remainder either stated that the international content was either insufficient or non-existent. Furthermore, as may be expected, some thought that much of the international content included that was offered was heavily Americanised. Students felt that local Australian content was also important, particularly where it related to their work opportunities. Again, this highlights the focus Australian students gave to their vocational needs, and content that they perceive will assist them in their vocational goals for the future.

Australian students also commented on what the university offers linked to internationalisation. They were very positive about exchange programs to the limited extent where they were available, but believed that more exchange programs (throughout Australia as well as overseas) would be of benefit to them. Some were aware of multicultural events and thought the university student village and the international student office provided a good service for international students.

Finally, students commented on what improvements ECU could make to support internationalisation. They made many positive suggestions. Some of these were related to improving the support for international students, including offering better support for international students and improving the international administration. Several suggested that ECU provide foreign papers and magazines in the library. A very useful idea was to provide more support for students from NESB by offering website information in different languages, and teach more foreign languages. They also recognised that more could be done to foster social interactions with locals. In addition, there were also suggestions that there should be scholarships for underprivileged students to do exchange programs, while others thought ECU should reduce tuition fees for students from poorer countries. Finally they thought there should be more interaction between participating countries, and that this should not be just economically driven, but primarily for education and cultural exchange purposes.

Conclusion

This research highlighted that Australian students are in the main very positive about internationalisation. They can see many benefits to themselves from the trend towards borderless education such as opportunities to travel through exchange programs, and the possibility of working overseas. They perceive internationalisation may bring common international standards, and even common curricula in the longer term. These are important and strong motivating factors that will encourage students to support the successful transition to increased internationalisation, and ECU will need to work at many external structural as well as internal institutional levels to achieve these goals for students. Students in the main are also very positive about sharing their education with students from overseas. They appreciate the opportunities made available for sharing of cultural norms, and the understanding they gain of the way things are done in other cultures and countries. Developing personal contacts and networks was seen as very beneficial. However, they are also cognisant that there may be disadvantages to the standards of their own education if international students are not supported to manage many of the issues they face on arrival at ECU. These include problems that can arise because of language barriers, religious differences and culture shock. It is important that ECU ensure that sociocultural norms and mores are addressed through the provision of appropriate support systems at the micro level. As well as a well resourced and comprehensive orientation programs, the university needs to consider more ways to encourage cross cultural appreciation, social interaction, and importantly, offer more intensive and wide ranging support for students experiencing language

difficulties. Finally, it is clear from this research that local students want more international content in the curriculum, and opportunities to study abroad during some part of their course. The time is ripe for ECU to strongly encourage academics to review their course content, and consider the goals and aspirations of local students, as well as international students, when implementing international content in their courses. It is also important that links are developed overseas to ensure that local students are given opportunities for international exchange.

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Quin, R., and Watson, A. Edith Cowan University, Australia. Mobile Computing: Is Teaching with Mobile Computers a Realistic Option?

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Introduction

The use of communication and information technology as both an administrative tool and a support mechanism for instruction has been relatively widely used since the 1960's. More than 40 years later C&IT has become ubiquitous and considerably more sophisticated than the days of green screen text terminals supported by expensive mainframe computers and limited function applications, particularly in education. The advent of the microcomputer, colour graphics screens, high speed networks, remote access capability, sophisticated software applications, mobile computing, other technologies, and informed users have all contributed to change the nature of computer based support in the university system.

Along with the business and health communities we have now adopted the "e" tag and refer to e-University, or e-Learning. The terms are ill defined, variable and cover a range of activities. But what has evolved in an e-University is more than a series of disparate applications which are computer based. The e-University is "integrated" in the way it uses C&IT as mainstream delivery, service and administration tools. The economies of scale from single sources of data and universal access subject to the business rules, the service goals and relevant laws. Fractionally computerized Universities may be able to operate effectively but in an internationally competitive market students have international expectations and one of these is delivery of curriculum materials online to facilitate flexible learning.

For example, in Australia students now expect to re-enroll via the internet, to be able to submit changes of enrolment, to check their student record to date, to be able to determine course options, to be able to submit assessment items and to undertake learning experiences all via the Internet. The use of ubiquitous mobile computing is further changing the access expectations of students and the teaching styles of lecturers. IT also changes the quality assurance expectations of the University and the roles of individual staff members. Lecturing staff are under greater scrutiny than 10 years ago as their teaching materials are digitized and broadcast around the world.

Students are also under increased scrutiny as electronically submitted assignments are automatically checked for plagiarism using a range of tools. Assignment deadlines are real as each assignment is digitally time stamped and assignments are automatically cross checked for work collusion.

In the highly competitive market to attract students it is clear the new generation of students turn to the Web for information to make their study selection decisions. If an institution does not provide enough information it is easily passed over in favour of one that is more forthcoming. Students will shop around to find the course, the quality and the delivery model they want and they are now acutely aware of the emerging mobile computing options. Not just laptop computers but experiments with PDA devices and mobile phones are emerging throughout the world and particularly in Asia.

It is predicted there will be significant adjustments to University C&IT infrastructures as a range of new technologies in communications, operating systems, database environments, server farms and storage networks spread from the business sector to the university environment. For example our need for storage demand has moved from megabytes (1 X million bytes) to terabytes (a thousand million bytes) and now systems with petabytes (a million million bytes) are on the market to meet the growing needs of video storage, the predicted next big driver for educational delivery.

Whilst it is unlikely we will ever cease to be amazed by technological innovation the big choices come in how we will utilize these advancements. This paper is about ECU'S journey down this path and our "ECU Advantage" project.

Mobility

What differentiates a laptop and a pda in terms of functionality? The answer these days is "not much" as the differences are based on capacity , size and additional functional options. There are experimental programs around the world summarized by Ray et al (2001) as *Personal Digital Assistants (PDAs), such as Palm Pilots, have the potential to revolutionize the middle school classroom*. Peterson (2004) suggests the PDA is a great data gathering tool outside the classroom but leaves open its effectiveness for the type of operation in use at ECU.

The size difference between a small microcomputer such as a Libretto or Sony Vaio and a fully optioned PDA like the HP range is not great as both fit comfortably into a student's bag. The key usage factors then relate to portability, connectivity, availability and functionality. Price can also be a determining factor in large scale adoption of technology.

It has been argued that if students had access to their learning resources for longer periods largely independent of location they would benefit from the improved flexibility of the learning environment. At universities like Arcadia in Canada, Wake Forrest in the USA, University of Warwick and University of Strathclyde in the UK projects were introduced to provide mobile computing facilities to students with the intention of improving the flexibility of the learning environment.

This paper focuses on similar goals enabled via the use of laptop computers, extensive associated curriculum development and a leading wireless network at Edith Cowan University in Perth Western Australia.

The ECU Experience

In its precursor format Edith Cowan University began using computer based training in 1975 using a time sharing minicomputer and text based screens. It was the common university technology available at the time but the quality of the instructional software was extremely limited. Microcomputers were introduced in our classrooms in 1978 for computing and education students. The first administrative systems delivered the payroll and a limited student enrolment and record capacity in 1975. That means just over 30 years ago we did not have a computer or computer application in the place. Now if an important computer application goes off line for 3 minutes the helpdesk is very busy and half a day outage appears to be grounds for a student protest. The dependence of our 20 000 plus students on C&IT support has changed but fortunately so has the service provided.

It was after ECU received its University designation in 1992 that we again focused on the hoped for benefits from our C&IT infrastructure. Perhaps surprisingly it was in the University's classrooms that the largest initial gains were made with the creation of learning systems and curriculum activities based on microcomputers and LAN technologies. Teaching about computers and teaching computer programming with computers was particularly effective. Using the computer as an instructional aid tool was still in its infancy at ECU but there were promising signs which were to see Professor Ron Oliver from ECU eventually win a national teaching award for leading Australia in using computers in the classroom in 1997.

What set ECU and the rest of the world on fire at this time was the recognition of the academic potential of the Internet and the freedom this supplied to academic staff to communicate with colleagues across the world. The big shift for us was to make this opportunity available to students as well with the implication that we had the infrastructure to support a large student base with largely unrestricted access 24 hours per day 7 days a week and 50 weeks a year. Student expectations were born in this era leading to what has been referred to as "flexible online learning" where students want access anytime and anywhere. It took ECU a decade to be able to meet our own expectations in this regard as we moved from a model with large numbers of desk bound computer laboratories on

campus, lighthouse curriculum development areas, limited curriculum delivery options and limited IT connectivity to the creation of a mobile ubiquitous computing environment with an extensive base of support curriculum materials which can be delivered and managed from one of three courseware systems, and extensive wireless and Internet connectivity.

Just how strongly students can drive demand for online access to learning materials and how fast their expectations grow was demonstrated at ECU when we believed we understood user adoption rates but somehow failed to predict the sudden and significant growth in our own adoption between 2001 and 2004. Figure 1 shows the student units registered on the 4 Learning Management Systems in use at ECU over that period. The SCAM Site and eCourse systems were created at ECU and are seen by the authors to have some advantages over the commercial Blackboard system. The total adoption of online supported units more than doubled in 2004 and is heading for 10 times as many as 4 years earlier. Currently 60% of all ECU student units are supported in this mode.

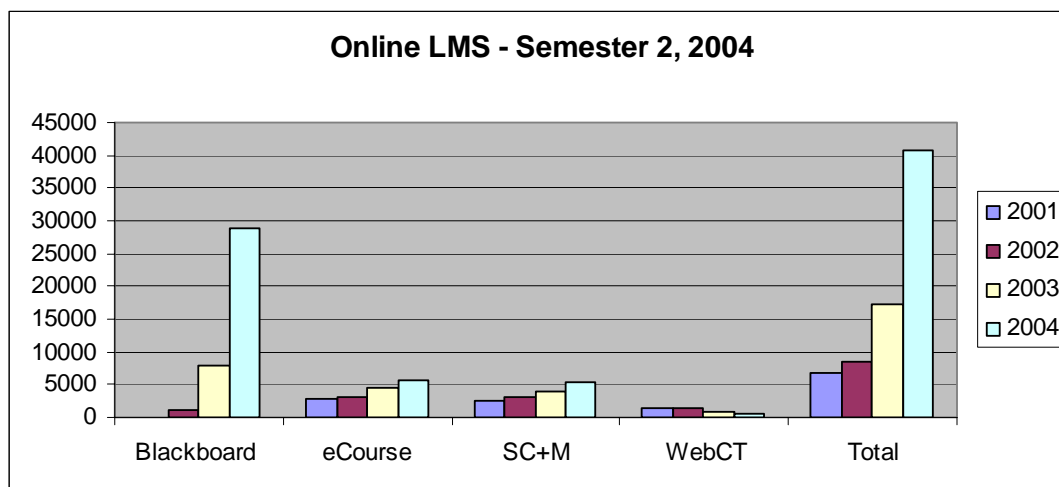


Figure 1: Number of student units for each LMS

The case for continued development of the “in house” ECU LMS systems is not uncommon in the university sector which has its own expertise in house and tends to lead the private providers by using current educational research practices to guide the development. For example ECU can adapt its own systems to include multiple mirror site options, incorporate specialized practicum modules, reflect the university’s thinking on assessment, and offer more flexible management to name a few advantages. The greatest advantage appears to have been the capacity to add functionality to the Learning Management System as desired and although there was a cost it was deemed the benefits were worth it. Commercial licensed systems seldom have that flexibility and certainly not the immediacy of change.

The capacity to experiment should not be underestimated and ECU will continue to integrate its quality audit infrastructure into our LMS environments.

The ECU Advantage

Until now the adoption of online support for teaching and learning has been based on assumptions of access from either an on campus computer laboratory or from the students’ resources off campus. In 2004 it was decided to trial complete cohorts of students in particular classes using a wireless laptop environment. Specifically each student would be provided with a wireless laptop for their sole use during a complete semester of study. The purpose of the trial was to obtain student feedback on a range of measures before attempting to develop further in this direction.

ECU has 4 “mega faculties” and 3 of these participated in the semester 2 2004 trial and all 4 will be involved in further pilot developments in semester 1 2005.

The Faculty of Community Services, Education and Social Sciences had 50, students of limited computer literacy capability in year 1 of the Education degree (teacher training). The Faculty of Communication and Creative Industries (FCCI) had a small group of 13 ‘digital media’ students who were familiar with the technology whilst the Faculty of Business and Law had 27 post graduate MBA students as their reasonably technology savvy cohort.

FCCI used SCAM Site to provide access to the teaching and learning materials and the other two faculties used Blackboard. The reliability of the ECU Blackboard environment was an issue during the semester and that problem is outlined in student feedback. One of the valuable lessons of the trial was to recognize the importance of 24 X 7 operations for any large scale teaching delivery system as student expectations quickly grow to that level.

Quin (2004) describes the project and its expected outcomes as follows: “The ECU Advantage IBM ThinkPad University Project is a strategic and institutional academic initiative. It builds on the available experience of earlier IBM ThinkPad projects such as those undertaken at Acadia University (Canada), Seton Hall, Northern Michigan University and Wake Forest (USA).

At ECU the expected outcomes of this project are the integration of new technologies into mainstream teaching and learning practices with the aim of:

- Supporting the use of notebook and wireless connectivity to assist students to achieve successful learning outcomes in an exciting and stimulating fashion
- Developing students’ confidence, knowledge and skills in the selection and application of technology appropriate to their field of scholarship (Use of Technology/Information Literacy – graduate attribute)
- Achieving an institutional advantage over competitors by adding value to the teaching and learning experience
- Expanding students’ use of online resources and information at ECU (ie learning management systems, library etc)
- Enhancing flexible delivery options for staff and students
- Making better and more efficient use of space
- Developing new teaching and learning models utilising mobile computing technologies
- Integrating technology into the university experience for academic staff by providing educational design opportunities, infrastructure and support.”

Results so Far

The ECU Advantage Project planned for an independent evaluation which was undertaken by Queensland University of Technology (2004). Some of their findings and data from a sample of students is included in this paper.

The evaluation report (2004, p5) found “Generally, the Faculty-based Project Teams are positive about the experience and their involvement, understanding of emergent impacts associated with a pilot, and feel they are well supported by the Project Team and support teams”. Questions in the student survey showed supportive comments with 84.6% of students agreeing with the statement “The laptop has assisted me with my learning”. And a large 96.9% of students agreed with “The staff members teaching this unit were able to integrate activities, using the wireless network, into the teaching and learning program” suggesting the efforts to integrate the T&L techniques had been successful. The integration of the curriculum and the media of delivery is an area that ECU T&L committees are acutely aware of and encourage a good deal of professional development training to assist staff in T&L growth.

Regarding the use of the laptop itself the evaluation report (2004, p7) says, “The education students reported that they only brought their laptops to University for this class and left it at home at other times. It should be noted that the laptops assigned to Education students were bulkier than those provided to the “digital media” students” and “It was interesting to note that in contrast to the Education students, the “digital media” students reported that they generally brought their laptops to University for most classes”. The finding is consistent with a verbal report from Strathclyde University where students opted for the “thin and light” model of laptop when they had a choice.

A finding which is not surprising to the project team was (Evaluation Report, 2004, p18), “The reliability of Blackboard was considered a major issue for the Faculty-based Project Teams using this service. It was perceived to be unreliable and as such impacted on the capacity for the Faculty-based Project Teams to use the online learning features as part of their learning design.” The report goes on to recommend “It is recommended that ECU review its learning management system (LMS) as a high priority with the aim of improving staff and student perceptions of reliability”. The university has begun this process but is aware that changing staff and students from one LMS to another requires a significant lead time and can be an emotional topic.

A finding at ECU which is consistent with the experience reported verbally from the University of Strathclyde was (2004, p22) “Users have described the robustness and reliability of the IBM laptops as an important feature for the pilot”. The number of machines requiring repair or field assistance was less than estimated based on experience with previous suppliers of laptop computers at ECU.

Feedback on the effects of laptop access from a student’s perspective included 78.4% of students agreeing with “The laptop enabled me to become better organised as a student in this unit.” and amongst the Education students this figure was 90.5%. Students who had significant exposure to computer access previously appeared less influenced by having their own laptop.

Also 93.9% of students agreed that “The laptop enabled me to complete learning tasks as an independent learner” and 90.8% agreed that “The laptop increased the resources available to me as a learner in this unit”. Also 95.4% of students agreed that “The learning activities involving the use of the laptop, were usually exciting and stimulating” suggesting that overall efforts to modify curriculum delivery processes to make use of the perceived benefits of laptop computers had been successful and offered students something extra.

Unfortunately 58.4% of students indicated “I have experienced frustration in using the laptop for tasks set by the lecturer.” It was observed that the project did experience some establishment problems, that some academic staff whilst enthusiastic were short on technical skills, the level of IT support was modified during the project and Blackboard experienced some delivery problems. Each of these areas is being addressed for the 2005 trial.

At the end of the student survey was a question designed to “test the degree of commitment “ to using a laptop in the form of “ After the experience of using a laptop, I would now like to purchase my own laptop”. A quite large 78.5% of students agreed with this statement and a further 9.25 said it was “not applicable” presumably because they already owned a laptop or had ready access to a laptop computer.

Next Step

The 4 megafaculties at ECU will use the extension of the laptop trial during 2005 in differing ways. The FB&L will re-run the 2004 trial with a new cohort of MBA students. The “digital media” group in FCCI will use the same cohort of students who will use the laptop in the third year of their course having been positive about the experiences in year 2. The FCSESS has decided to split its laptop base and will use 25 machines for a mobile lab for the Joondalup campus and 25 to be used for the first year multi-literacy support program.

The faculty of Computing, Health and Science will join the project with a p/g program where each student entering the Master of Information Technology at the Perth campus in 2005 will receive an IBM Thinkpad computer for their sole use during their studies at ECU. This course has all units available in the online support mode and several of these are being further upgraded in terms of the provision of computer based materials such as simulations.

The University continues to expand its support environment and has now installed the first Nortel “mesh” covered wireless campus in the southern hemisphere. The outcome is increased traffic flow capability and access point availability from anywhere on the two major campuses at Joondalup and Mt Lawley in Perth.

The continued development of curriculum materials is essential both in terms of unit coverage and maintenance of currency of existing units. Given that ECU has approximately 60% of its units (or courses in some educational cultures) in an online supported mode it is likely this number will grow to 80% during 2005. The University has a very strong Teaching and Learning Committee with a PVC(T&L) driving this project and the quality agenda at ECU to ensure there is appropriate follow up based on our experiences and research. The Australian Universities Quality Agency (AUQA) released its quality assessment of ECU saying “ The history of ECU is one of strong commitment to teaching and to students ... and is well supported with resources... designed to mainstream best practices.” (2004,P3.). The use of delivery systems, like SCAM Site and eCourse in particular, facilitate the quality control infrastructure and the demand for expansion of this environment is student driven

ECU, IBM and W.J Moncrieff Pty Ltd are establishing a shop front on campus to facilitate student purchase of Thinkpad laptop computers as our research has shown students are comfortable using the laptop environment and do see an academic advantage in being able to use this technology. The model used will be similar to that in operation at the University of Strathclyde in the UK.

ECU has already approved funding for a trial video streaming project where conventional lectures will be recorded and made available to students via our LMS. The keys to success will depend upon being able to record lectures and include presentation material without significant support staff to operate the equipment and secondly to ensure the network infrastructure can carry the student demand load for video streaming.

The success of the 2004 trials has encouraged ECU to continue down this path and arguably teaching with mobile computers has been a positive learning experience for students. ECU intends to expand and improve our teaching and learning support for students and mobile computing will be one of the options available. The next issue to address is how scalable this model can be.

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Robert, C.S. Chiang Mai University, Thailand. Information Provided by International Tourists at Government and Private Sector Tourist Destinations: A Case Study of the Tarutao Archipelago, Thailand

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ABSTRACT

A survey of international tourists at Tarutao and Adang Islands (national park) and Lipe Island (private sector) evaluated information provided on five different ecology-related areas plus culture and history. Respondents rated their interest in each of the seven areas and rated the helpfulness of three types of information media provided: printed material (brochures, pamphlets, maps); interpretive signs; and information provided by park staff/local guides.

Interest levels in all areas was high. Age correlated positively with environmental areas and history; females had more interest in history than males. Education was correlated with land animals and culture, with lowest ratings from tourists with undergraduate degrees.

Many of the information ratings differed significantly between the national park islands and Lipe Island, with the park islands rated higher. Only for fish/coral and culture was information media at Lipe rated higher than that at the national park islands and those differences were not statistically significant.

Printed media were most available at the park islands. The only printed media found on Lipe was a dive shop advertisement. Interpretive signs were most prevalent on Tarutao Island which had more walking trails. Adang Island, where topography and flora make hiking challenging, had fewer signs but did have a large area coral reef map. Lipe had few signs of any type. Tarutao and Adang Island information booths were regularly manned by park staff who provided information on boat tours, nature walks, etc. Lipe Island had no operational central information point.

Surveyed tourists wanted more information of all types, particularly more and better maps. In summary, the supply of information (with the possible exception of national park staff) was far exceeded by the demand. Collaborative efforts between local universities and national park and the private sector could help meet that information demand.

BACKGROUND

Thailand has many significant tourist destinations. Some are of particular historical interest such as Ayudhaya and Sukhothai in the central region. Other destinations are characterized by exotic cultures such as the hilltribes of the north while some have ecology as their key attraction such as Khao Yai National Park in the northeast. Still other destinations are known primarily as locations for rest and recreation, e.g., the beaches of Chonburi Province on the Gulf of Thailand. One tourist destination, however, combines all four factors in one: the Tarutao Archipelago which is located in the far south about 30 kilometers west of Pak Bara town, La-Ngu District, Satun Province on the Andaman Sea.

The Tarutao archipelago of some 51 islands includes an area of 1,490 square kilometers. (Gray, Piprell and Graham 1991, pp. 81-84) The largest island in the group, Tarutao Island, covers about 151 square kilometers and is only five kilometers north of Pulau Langkawi, Malaysia. This island is of historical interest as it was used as a prison for both political and ordinary prisoners from 1939 to 1946 until events related to World War II prevented Thai officials from re-supplying the prison staff and

prisoners with food and other essentials. After the Corrections Department closed the prison, villagers from nearby provinces moved to the island where they engaged in fishing and growing rice, rubber trees, coconuts and jackfruit. In 1964 the British Royal Navy helped route the pirates based at Tarutao who had been preying on merchant ships as they transited the Straits of Malacca. (Pate 1990, pp. 12-13) Later, in 1974, when Tarutao National Park was gazetted, the farmers and fishermen living there were invited to leave following national park policy. Sea Gypsy people (also known as *Thai Mai* or New Thai) were permitted to remain on one of the islands in the archipelago, Lipe Island, which was excluded from the park. (Personal communication with Dr. G. Lamar Robert regarding his interviews in 1992 and 1993 with former Tarutao Island farmers)

Tarutao Island is predominantly limestone, so water in the rainy season quickly percolates down through the soil and underlying rock. The result is a largely deciduous flora which loses its leaves in the dry season. The local fauna includes many species of birds and animals acclimated to this ecological regime. Tarutao also boasts a diverse mangrove habitat which acts as a nursery for young members of many marine species including fish, mollusks and other invertebrates. Many long sandy beaches and some limited coral reef formations surround the island.

Adang island, some 30 square kilometers of land (Martin and Cummings, 2002, p. 481) located 45 kilometers west of Tarutao Island, also has a history, though less well publicly documented than Tarutao. On Adang there is a building located in an abandoned coconut plantation which is described as a former customs station which hints at the island's pre-national park status as a major international commercial center.

Adang Island, being granitic, retains more moisture in the soil than Tarutao Island and so has a primarily evergreen forest cover and a variety of fauna which thrives in that environment. It is characterized by relatively high hills and rugged terrain. A few small mangrove forests can be found around the island and many of Adang's sandy beaches (and some of its rocky coast areas) are fronted by coral reef formations.

Another island in the group of particular cultural and historical interest is Lipe Island. This relatively small island of some four square kilometers (<http://andaman-island-hopping.com/islands/adang.htm> 29 July 2004) is located about half a kilometer south of Adang Island and is currently populated by about 1,400-1,500 Sea Gypsy people (<http://www.unesco.org/csi/act/thailand/matichon-Jun03.htm>, 21 March 2004) some of whom moved there when Tarutao became a national park. These people are a distinct minority group who traditionally made their living exclusively from the sea. They lived most of their lives on their boats, moving from place to place depending on the seasons and the weather, only returning to land for special activities such as building new boats and for funerals, hence the epithet 'sea gypsies'. These people, who have now ceased their nomadic ways, were granted last names for the first time by the Queen Mother in 1959. (Somboon Ayarak, Public Health Officer, Phuket Province and Sea Gypsy researcher's lecture to University of Wisconsin students at Phuket Province, 28 May 2004) They still practice many of their traditional customs, including the important boat floating ceremony and still speak their own Sea Gypsy dialect, that of the Urak Lawoi. (Ivanoff 1997, pp. 107 and 109) Note: the Moken and the Urak Lawoi are the two major groups of Sea Gypsy people.

Lipe Island is relatively flat and has little topsoil so the water around the island is relatively clear, providing habitat for a number of coral reef formations. Sandy beaches are found along much of the shore of the island.

Attesting to the value of the assets of the archipelago, on 29 November 1984 Tarutao National Park was declared an ASEAN National Heritage Park And Nature Reserve. (<http://www.aseansec.org/6078.htm>, 28 March 2004) To be of value, however, as described in communication theories (see, e.g., Littlejohn 1992, pp. 132-168), the message about the archipelago must be transmitted to a receiver, e.g., to visiting international tourists.

OBJECTIVES

It has often been said that people protect what they love and love what they understand. With that concept in mind, this study was undertaken to identify measures to increase international tourists' understanding of the many valuable facets of the Tarutao Archipelago.

The specific objectives of this research are to: (1) determine the level of interest of international tourists regarding different aspects of the government (national park) and private sector segments of the Tarutao Archipelago, (2) determine the attitudes of international tourists toward the information provided on those aspects, (3) review the information media provided to international tourists and (4) identify strategies for augmenting the available information to better meet the desires of the international tourists.

METHODOLOGY

During four weeks beginning 22 December 2002, international tourists who were staying at Tarutao Island, Adang Island and Lipe Island completed a questionnaire. Respondents, who were selected randomly, were asked to specify on which of the three islands they spent most of their time during their current visit and to provide basic demographic information. They were provided a list of nine possible areas of interest regarding the islands and were asked to rate the importance of each areas of interest on a scale of 1 (least important) to 5 (most important). The areas of interest included all four tourist focuses described above: rest/relaxation, beach/swimming, birds, land animals, forests, mangroves, fish/corals, history and culture.

Respondents were also asked to rate the helpfulness of three categories of information (brochures, pamphlets, maps; interpretive signs; and information provided by park staff/local guides) using the same five point scale. Finally, respondents were provided an opportunity to specify desired changes/additions to available information.

An effort was made to obtain copies of all English printed media available at all three islands and at Tarutao National Park Headquarters on the mainland, to observe as many interpretive signs as possible on all three islands and to informally interview park staff (Tarutao and Adang Islands) and local guides (Lipe Island) to determine what information was available for tourists.

RESEARCH RESULTS

Demographic Profile

A total of 374 international tourists completed the survey questionnaire of which 22.5% were staying at Tarutao Island, 10.7% at Adang Island and 64.7% at Lipe Island. Of the total, there were more males (56.2%) than females (43.8%) with most (62.0%) aged 25 to 40 and were well educated (64.7% had a bachelors degree or higher).

The tourists surveyed came from 30 different nations and spoke 22 different first languages. The majority (77.8%) came from Europe. Respondents spoke a total of 22 different first languages, with English (31.6%) and German (20.1%) predominating. No other first languages were spoken by more than 10% of the people surveyed.

The size of groups traveling together at each island ranged from single individuals to one party of 17, with an overall average of 2.97. There were relatively few children (age under 18) among the tourists, with over 82.4% of the groups having no children at all. Lipe had by far more long-stay tourists than Tarutao and Adang: some 73.4% of tourists to Lipe stayed five or more days, versus 29.8% for Tarutao Island and 35.0% for Adang Island.

Most (81.4%) of the respondents were visiting the Tarutao Archipelago for the first time. Adang Island had the most 'repeat' tourists, visiting two or more times, at 26.4% followed by Lipe at 18.6% and Tarutao Island at 7.3%.

Interests of International Tourists

Tourists surveyed were provided with a list of nine potential areas of interest in the archipelago, plus an ‘other’ category where they could specify different areas of interest. (Other reasons provided by a tourists included caves, quietness, lack of development, being away from mass tourism, hiking and being in a national park.) They were asked to rate the relative importance of each of the areas of interest on a scale of 1 (unimportant) to 5 (very important). Statistical analysis of ratings by island using ANOVA (Table 1) and t-Test (Table 2) is shown below. In this and subsequent tables ‘Primary Island’ refers to the island on which the tourists reported spending the majority of their time during their current visit.

Table 1. Tourists’ rating of areas of interest by island

Area of interest	Primary Island			Overall
	Tarutao Island	Adang Island	Lipe Island	
Rest, Relaxation	4.39	4.30	4.62	4.53*
Beach, Swimming	4.23	4.29	4.50	4.42*
Birds	2.75	3.27	2.61	2.71**
Land Animals	3.52	3.34	2.76	3.00**
Forests	3.72	3.51	3.26	3.39**
Mangroves	3.44	3.03	2.80	2.97**
Fish, Corals	3.90	4.18	4.50	4.33**
History	2.67	2.92	2.93	2.87
Culture	3.07	3.62	4.02	3.76**

One-way ANOVA significance of differences among islands

* P < 0.05

** P < 0.01

Table 2. Significant inter-island differences in areas of interest (t-Test)

Area of Interest	Primary Island	Significance
Rest, Relaxation	Lipe – Tarutao	.030
	Lipe – Adang	.032
Beach, Swimming	Lipe – Tarutao	.016
Birds	Adang – Tarutao	.037
	Adang – Lipe	.002
Land animals	Tarutao – Lipe	.000
	Adang – Lipe	.005
Forests	Tarutao – Lipe	.002
Mangroves	Tarutao – Lipe	.000
Fish, Corals	Lipe – Tarutao	.000
	Lipe – Adang	.041
Culture	Adang – Tarutao	.017
	Lipe – Tarutao	.000
	Lipe – Adang	.045

Note: **Bold** island had the higher rating

Analysis by island found that rest/relaxation, beach/swimming, fish/coral and culture were significantly more highly rated by Lipe tourists than national park tourists. Birds was most highly rated at Adang Island, while both Tarutao Island and Adang Island rated higher than Lipe Island for land animals. Tarutao Island was rated higher than Lipe for both forests and mangroves.

Ratings of areas of interest were also analyzed using ANOVA and t-Test procedures to investigate relationships with demographic factors. This analysis found that age was positively correlated with all environmental areas: older people placed a relatively higher value on environmental aspects than did

younger tourists. Education was significantly linked to only one factor, land animals, producing a U-shaped function: the lowest ratings for interest in land animals were by tourists with undergraduate degrees. Those with higher levels of education and with lower levels of education rated land animals higher than the undergraduates. Women rated rest/relaxation higher (4.64) than did men (4.44).

Available Information

1. Printed Information

The printed information in the English language that the researcher was able to locate included three booklets, five pamphlets, and five single page sheets. None was available in any language other than English or Thai. An annotated description of each is provided below. The majority of the documents were found only on Tarutao Island. Only one printed document, number 11 below, was found on Lipe Island.

• Brochures, Pamphlets and Maps

(1) Tarutao National Park A Traveler's Adventure Handbook. Written by Ami Pate, U.S. Peace Corps Volunteer, 1990. First printing edited by Siriwat Paowongsa 1997. Revised and updated by Maria Hardy, VSO Volunteer 1999. Printed by Tarutao National Park.

40 pages. Includes basic information on the park, a map of the main park headquarters on Tarutao Island, history of Tarutao, climate, terrain, flora and fauna including drawings of selected birds, marine life, a map of Tarutao Island (scale approximately 20,000:1) including descriptions of places to explore shown on the map, information on other islands including Adang and Lipe but no similarly detailed maps of those islands.

(2) Coral Reefs and You in the Tarutao National Park. Includes Marine National Park Thailand symbol. Undated. Four pages, color photographs.

4 pages. Good descriptions of coral reefs and their ecosystem, how to dive safely and ecologically appropriately, and some information on accommodations.

(3) National Park 'From National Parks to Conservation Forests for the People'. National Parks Division, Royal Forest Department. (January 2001)

12 pages. A listing of national parks in Thailand including 81 terrestrial parks and 24 marine parks. Includes tables showing the distance to parks from various locations in Thailand, but both the names of the provinces and the parks are in Thai – the only Thai in this brochure.

(4) Satun. Tourism Authority of Thailand Southern Office, Region 1. Undated.

38 pages. Includes good general information on sites of interest at Tarutao, Adang and Lipe (spelled Lipeh). Has information on the history and culture of the archipelago, a calendar of festivals in the province (including the 'Fishing competition Tarutao-Adang Fishing Cup'! in March and a 'Boating Festival' at Lipe (spelled Li Peh) in November. Includes boat timetables (but not travel times) and fares to the islands. Provides information on available accommodations on Lipe (number, cost) but not for Adang or Tarutao.

(5) Tarutao National Park Thailand Pearl of Andaman. Undated. Marine National Park Division, Royal Forest Department.

12 page folded brochure includes a good, brief cultural-historical description of Tarutao, marine life (including mangroves). Has some limited information on specific sites to visit, including Adang and Lipe. Provides a not to scale map of the archipelago.

(6) Handbook of Marine National Parks Andaman Sea. Undated. Marine National Park Division, The Royal Forest Department

24 pages of color photos and short description of eight marine national parks. Includes small maps of the area of each park

- **Single Page Information Sheets**

(1) Explore Ko Tarutao. Undated. Black and white.

One sheet describing sites on Tarutao Island; back side shows a map of Tarutao with points of interest noted (scale approximately 12,500:1)

(2) Tarutao National Park Tourist Information. Maria Hardy, VSO volunteer. Printed by Service and Development Sub-Division, August 2000. (One edition, black on orange paper; a second edition orange on white paper).

One sheet describing highlights of Tarutao and other islands including Adang and Lipe. Map of the archipelago showing key sites. (scale: approximately 40,000:1).

(3) Ecotour 2 Pante Malaka River and Crocodile Cave. Maria Hardy, VSO volunteer. (Orange on white).

Copies reproduced with donations from tourists to Tarutao Park. Describes the ecosystem of the mangroves, the boat trip and possible wildlife to be seen, and a geological-historical description of the cave itself. No other **Ecotour** sheets were seen by the researcher. Includes a map showing the water route to the cave. (scale: approximately 3,500:1)

(4) Exploration Tarutao National Park. Marguerite Young, WWF Australia. Undated. (Green on white)

Describes specific locations on Tarutao Island. Includes scenic photographs and a not to scale map of the archipelago showing locations of, e.g., park headquarters/ranger stations, accommodations, and hiking trails. Does not include maps of the trails themselves.

(5) Forra Dive Centre PADI Facility. (Black on white)

Short commercial advertisement for snorkeling, kayaks, diving courses based on Lipe.

Most documents focus on environmental and recreation. Limited amount on history (all about Tarutao Island history) and virtually nothing on Sea Gypsy culture.

2. Interpretive Signs

The category of interpretive signs includes directional signs telling how to get to points of interest or showing the location of trails. It also includes signs posted at strategic locations around the park and/or along trails which provide additional information about a particular site, a specific type of fauna or flora, etc.

In addition to the posted signs, other interpretive media was available at some locations, specifically, a museum and a library on Tarutao Island. The interpretive signs observed by the researcher are described for each of the islands.

(1) Tarutao

On Tarutao Island, trail signs are provided along key nature trails. These signs provide information on the distance/time to various destinations. There are also some interpretive signs providing detailed information on specific local fauna and/or flora located along some trails. Most of the marked trails are within an easy walk of the island's park headquarters. There were no interpretive signs at Crocodile Cave or along the mangrove-lined canals leading to the cave.

While not strictly an interpretive sign, the Tarutao Island museum provides tourists information on a number of subjects including local fauna and flora of the archipelago, the cultural and political history of the Tarutao Island prison as well as ecological descriptions of different environments found on the island. In this relatively small space, a wide variety of media were used to provide the information. The centerpiece was a large three-dimensional map of the islands showing elevations as well as

relative positions. Surrounding this were drawings and pictures, dioramas, skeletons, preserved specimens, old photographs, historical artifacts and more.

Tarutao Island also had a library containing an eclectic collection of material, both books and magazines, some of which was related to the islands and the marine environment, but much was of a more general nature.

(2) Adang

Storm damage in October 1999 made major modifications to the park headquarters on Adang Island. Several buildings, including one which had formerly housed a limited supply of interpretive material and a budding museum, were washed away. A large detailed map of the location and quality of coral reefs around Adang and nearby islands was erected centrally near the park headquarters facilities and the longhouses.

On Adang, there were trail signs to the two primary hiking trails: a nearby waterfall and to a cliff overlooking the narrow stretch of water between Adang and Lipe. There were no interpretive signs along the trails to provide additional information on the fauna, flora, geology, etc.

(3) Lipe

There was a sign designating an information center located at the school on Lipe where a few interpretive picture posters of fauna and flora had been posted, but the amount of material available was limited and the center was not manned on a regular basis. There was no museum or other interpretive material dealing with sea gypsy culture, e.g., traditional boats, fishing methods and fishing gear, etc.

There were few trail signs on Lipe. The signs observed directed tourists to specific areas around the Sea Gypsy village, e.g., Pattaya beach. Beyond that, there was nothing to indicate that hiking trails existed on the island.

3. Park staff and local guides

Park staff were present and much in evidence on Tarutao Island and Adang Island. Staff members and other island residents on request acted as guides for tourists to specific sites, e.g., boat excursions to different areas of the islands. Lipe Island, as it is in the private sector and not part of the park, had no park staff. Adult residents of Lipe acted as boat drivers and guides for tourists, with booking of trips done through the various bungalows and/or restaurants on the island.

(1) Tarutao

On Tarutao, park staff and other island residents cooperatively provided guided tours of specific sites of interest, particularly Crocodile Cave which is located deep in a mangrove forest. The staff also provided explanations and descriptions of specific aspects of particular interest. (As the researcher speaks Thai, the English language ability of the staff/guides in Tarutao National Park was not assessed directly.) Tours of other parts of the island (including circumnavigation) by long-tail boat were also available on request. Knowledgeable Park staff were ready to guide bird-watching tours in the early mornings, using their extensive local experience to find and identify many different species. Publicity about these services was, however, rather limited.

At the park headquarters, an information station was manned on a regular basis, and the park staff showed themselves ready and eager to answer tourists' questions and provide other assistance as needed to insure that tourists got the most out of their trip.

Of particular note is the Tourists Center which offered a free narrated slide presentation in English each evening which covered many aspects of Tarutao National Park and its varied ecosystems.

(2) Adang

Park staff were helpful in arranging boat tours to a selection of predetermined sites on Adang and nearby islands. The tours available were clearly described in a menu-like document from which tourists could choose their boating activities for the day. Like a menu, the prices of the tours avoiding the hassles of bargaining. This menu was plainly displayed at the information center.

At the park headquarters facilities on Adang, park staff were regularly available to answer questions and assist tourists.

(3) Lipe

There was no central location for arranging boat tours or tour guides on Lipe. Rather, each bungalow and restaurant acted as independent tour companies offering long-tail boat trips to different coral reef sites on Lipe and other nearby islands. SCUBA diving, kayaking and snorkeling expeditions were offered by a private diving organization located on Lipe.

A year or two prior to the survey, a Lipe school official voluntarily initiated a *Little Guides Program*. Secondary school students were provided training and experience in various aspects of the tourist industry, a mainstay of the Lipe economy. The founder of the program explained that he started the Little Guides to help prepare the local people to be able to actively participate in the tourist business rather than just sit and watch as 'outsiders' took over. During the period of this survey, however, no Little Guides activities were in evidence.

Rating of media

Tourists rated on a five point scale the helpfulness from 1 (least helpful) to 5 (most helpful) for each of each of seven categories of information provided (birds, land animals, forests, mangroves, fish/corals, history and culture) and each of the three sources of information (printed media, interpretive signs, park staff/local guides). Rest/relaxation and beach/swimming were excluded from this portion of the survey. Respondents were not shown copies of the printed media described in the previous section.

Analysis of rating of the helpfulness of information media found younger tourists (40 and under) rated fish/coral information from interpretive signs and from park staff/local guides higher than did tourists aged over 55. For reasons not immediately obvious to the researcher, tourists with some undergraduate studies rated mangrove information from park staff/local guides higher than tourists with either higher (undergraduate degree or more) as well as those with lower levels of education (high school or below).

Many of the information ratings differed significantly between the national park islands and Lipe Island, with the park islands rated higher. Only for fish/coral and culture was information media at Lipe rated higher than that at the national park islands and those differences were not statistically significant.

Table 3. Tourist ratings of information provided by category, media and primary island

Information Category – Media Type	Primary Island			Overall
	Tarutao	Adang	Lipe	
Birds – Brochures	3.55	3.41	2.94	3.17**
Birds – Signs	3.48	3.23	2.79	3.07**
Birds – Staff/Guides	3.79	3.10	2.92	3.19**
Land Animals – Brochures	3.40	3.56	2.97	3.16
Land Animals – Signs	3.55	3.35	2.95	3.19**
Land Animals – Staff/Guides	3.63	3.24	2.97	3.20**
Forests – Brochures	3.39	3.57	3.15	3.28
Forests – Signs	3.60	3.54	3.15	3.35*
Forests – Staff/Guides	3.46	3.35	2.93	3.14*
Mangroves – Brochures	3.00	3.46	2.82	2.95
Mangroves – Signs	3.17	3.18	2.81	2.97
Mangroves – Staff/Guides	3.28	2.94	2.70	2.91*
Fish/coral – Brochures	3.48	3.76	3.66	3.61
Fish/coral – Signs	3.18	3.52	3.55	3.44
Fish/coral – Staff/Guides	3.33	3.71	3.67	3.61
History – Brochures	3.38	3.64	3.37	3.40
History – Signs	3.43	3.43	3.29	3.35
History – Staff/Guides	3.44	3.32	3.18	3.27
Culture – Brochures	3.06	3.69	3.39	3.34
Culture – Signs	3.00	3.48	3.30	3.25
Culture – Staff/Guides	3.33	3.33	3.38	3.37

One-way ANOVA significance of differences among islands

* P < 0.05

** P < 0.01

Table 4. Significant inter-island differences in tourists' rating of media (t-Test)

Information Category	Media Type	Primary Island	Significance
Birds	Brochures, pamphlets, maps	Tarutao – Lipe	.004
	Interpretive signs	Tarutao – Lipe	.001
	Park staff/Local guides	Tarutao – Lipe	.000
		Tarutao – Adang	.025
Land Animals	Brochures, pamphlets, maps	Tarutao – Lipe	.026
		Adang – Lipe	.040
	Interpretive signs	Tarutao – Lipe	.002
		Tarutao – Lipe	.003
		Tarutao – Adang	.025
Forest	Interpretive signs	Tarutao – Lipe	.019
	Park staff/Local guides	Tarutao – Lipe	.018
Mangroves	Park staff/Local guides	Tarutao – Lipe	.009

Note: **Bold** island had the higher rating

Tourists' evaluations of each type of information media for all seven areas of interest were combined to develop an overall rating of the perceived helpfulness. Results of that analysis are shown in Table 5 below. One-way ANOVA analysis found no statistically significant difference among the islands.

Table 5. Tourists' combined average rating by type of media by island

Media	Primary Island	Rating
Brochures, Maps	Tarutao Island	3.25
	Adang Island	3.71
	Lipe Island	3.14
	Total	3.24
Interpretive Signs	Tarutao Island	3.26
	Adang Island	3.50
	Lipe Island	3.00
	Total	3.137
Park Staff, Guides	Tarutao Island	3.35
	Adang Island	3.25
	Lipe Island	2.99
	Total	3.11

Additional media desired

The survey questionnaire completed by the international tourists included open questions to give respondents and opportunity to suggest changes and additions to currently available information. Responses are grouped into six areas.

- 1. Maps.** The type of information most frequently requested by tourists to all three islands was better maps. They wanted maps of appropriate scale (about 1:5,000) annotated with sites of interest as well as hiking trails and good snorkeling locations.
- 2. Terrestrial fauna and flora.** Tourists requested both more information on fauna and flora be available in brochures or other publications. In addition to more trail signs, tourists suggested using the Canadian parks system of providing photographs of animals and examples of shells near areas where they are likely to be found. They also expressed a desire for talks by park rangers on wildlife related topics.
- 3. Marine fauna and flora.** Desires were similar to terrestrial fauna and flora: information (including photographs) of fish, corals, etc., and where to see them. Also requested was information on sea turtles and how to protect the reefs. Tourists had a strong aversion to commercial fishing boats in the park as well as to the sea gypsy's underwater fish cages. No information on efforts to restrict commercial fishing and explanations of the sustainable fishing methods of the sea gypsies was provided by the park or by Lipe residents.
- 4. Culture / history.** Tourists to all three islands wanted more information on both culture and history. Tourists wanted to see more activities on Lipe managed by indigenous sea gypsy people. No information was readily available on which of the operations on that island were in fact run by local people.
- 5. Tours.** Tarutao tourists desired more easily available information on available tours. More information on available eco-tours provided by park staff was also requested.
- 6. Information provide by park staff.** Park staff on Tarutao and Adang were virtually uniformly praised for their helpfulness in providing information. Better English language ability was the only suggested improvement. Lack of knowledge that Lipe is not part of the park resulted in tourists to that island being critical of the lack of park staff there. There was no information readily available on Lipe to indicate its status as a non-park island.

CONCLUSIONS AND RECOMMENDATIONS

International tourists to the Tarutao Archipelago were diverse in terms of nationality and languages, but relatively uniform in their relatively high level of interest in the environment, both marine and terrestrial. There were significant differences in areas of interest among the three islands.

The available environmental information was generally rated as moderately helpful by the tourists, with Lipe Island frequently rated lower than the other islands. Environmental information media was limited at the national park (Tarutao and Adang Islands) and virtually non-existent at Lipe Island.

Based on the international tourists' rating of interests, rating of available information and suggested for improvement of information media, it is recommended that additional printed documents be prepared to include more detailed information on all aspects of the islands and that appropriately scaled maps be made available and that additional interpretive signs be provided along walking trails.

In the preparation of the additional documents and interpretive signs, particularly for Lipe Island, it is recommended that the communication faculty of a local university be invited to participate. This cooperation would provide additional resources for preparation of information media about the archipelago and would provide an opportunity for the university to gain practical experience while doing a community service. It is recommended that at Lipe Island the university investigate avenues for preparing the material in cooperation with the local school and the Little Guides.

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Rathinavelu, A., Manickam, M., & Ramaswamy, C., Dr. Mahalingam College of Engg and Technology, India. Knowledge sharing system using ICT to find out improvements in Teaching – learning cycle A case study in an Indian higher education system

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ABSTRACT

Education will change tremendously within next few years as pointed out by many educationists. Learning will become part of every individual life. Teaching and Learning process adopt new technologies to fulfill the various requirements of the learners. Knowledge Management (KM) is one of newly developed theme to improve Continuous Learning Process in an educational institution. Education is closely associated with KM to identify, create and share updated information and existing knowledge with every one of virtual learning communities. Recent development in Information and Communication Technology (ICT) helps to create and share high – quality multimedia contents through Internet Technologies for knowledge sharing among teachers and students in e-learning environment. According to few KM Practitioners, KM and e-learning are isolated concepts. But we look for a new system to support Collaborative and Teamwork in Virtual Learning Communities through ICT based knowledge sharing tool. In higher educational institution, Virtual Learning, Communication and exchange of ideas and opinions between professors and Students would definitely increase the possibilities for successful results. In addition to this, there is necessity for higher educational institutions to take initiatives to share knowledge among teaching faculties and students.

In Virtual Learning environment, students will get necessary information about Curriculum, Assignments, Test, Lecture notes, References, URL links, Latest Technology information, White papers, Discussion forum, Desktop Video Conferencing and so on. In every higher educational institution, Teaching faculties don't get an effective knowledge share tool to create and share their knowledge base among themselves and with student communities. This paper will assess the need and demand for using Information and Communication Techniques (ICT) to develop a knowledge share tool to improve effective Teaching – Learning Process.

Introduction

Globally, educational institutions are increasingly moving towards the delivery of courses using computers to provide students with the opportunities to learn at their own pace, together with a reduction in traditional lectures. There is also a trend to provide access to the courses via the Internet or intranet (Kemmm, R.E., 2001). According to Johnson and Johnson (1992), cited in Kemmm, R.E.(2001) collaborative learning is recognized as a potential factor in supporting the development of higher order cognitive abilities. We provided such kind of collaborative learning opportunities for students thro our e-learning model called as K-Share.

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The idea behind our development (called K-Share) is to create and share the lecture content materials by faculty members to students during regular course work. Colleges may use many teaching-learning tools such as webCT, blackboard from leading technologies. But we initiated our faculty members to develop a customized knowledge-sharing tool for our higher education institution. Our efforts are put

in to develop and integrate knowledge management practices along with e-Learning concept for producing better academic learning performance and subsequent improvements in their (university exam) results at this learning environment.

The global aim is in developing online learning content by lectures and sharing it among faculty members and then deliver to students during the time of learning. Our concept of knowledge-sharing system consists of

- (a) Simple and friendly workplace
- (b) Easy tools to include lecture notes in the format of word doc, PPT, PDF and so on
- (c) Provide link to required web resources
- (d) Access to respective subjects each semester
- (e) Tutor will evaluate the student usage on respective notes/resources of the subjects
- (f) Student will provide feedback about usage of k-share
- (g) Web OPAC
- (h) Discussion forum
- (i) Email system

This paper will discuss about the e-learning approach need for students of Indian institution, need of Knowledge management practices for faculty members of higher educational institution, benefits of knowledge sharing concept in education sector, Components of K-Share system, finding improvements from the usage of K-Share system.

Results so far suggest that the usage of K-Share system motivates self-learning of student and their academic performance is improved a lot in the result of university exams from earlier stage of conventional method of learning. At the same time, the level of confidence is found high with concerned faculty members.

INDIAN EDUCATION SYSTEM

Over the past decade there has been a growing concern about the role of higher educational institutions and how they are meeting the needs of employers. Increasingly, higher education institutions are being asked by industry, government and higher education funding bodies to produce graduates with versatile workplace skills, as well as subject-specific skills (Luca et al, 2001). In general, the education sector could be described as one where there is slow creation and diffusion of knowledge. The general question is when KM is a driving force for change else where, how is the education system responding and how should it respond? (Walshe,J., 2002).

In India, colleges are generally affiliated with reputed universities in every region. Universities do frame the syllabus first and then send to affiliated colleges to prepare lecture materials for classroom teaching to students in respective places. The university will conduct the final exam. In this set up, every college prepares their own lecture materials and delivers the same to students. The preparation of lecture material and content may vary from place to place and teachers teach the same syllabus differently. Because teaching is based on the skill of teacher, background of student, method of teaching and teaching aids. Dr.Mahalingam College of engg and technology is established with Internet and intranet facilities for about 1000 computers for various branches of study in Engineering, Science and Technology. Campus is wired with fiber optic cable with 4 Mbps Internet bandwidth connectivity with redundant capacity. Faculties are trained to use of Internet tools and Interactive multimedia tools for classroom experience since 2001. Video conferencing facility is extended with international institutions for collaborative project work. Since the management has implemented facilities in information and communication technology(ICT), we would like to benefit our students better in higher learning activities at our institution. In the university setup, our role is to ensure the same level of input and to provide quality – learning materials to the students . The lecture content is generally screened and advised by the appointed Subject Matter Experts (SMEs) before delivering to students. Lecture notes are well-prepared by using interactive multimedia technologies using standard

instructional guidelines. Presently, Our K-Share system is made available through intranet for students to access the learning content within our institution.

E-LEARNING APPROACH

In the year 2002, we decided to provide web-based learning approach to improve the self-paced learning by students. In general, K-Share tool is aimed to improve, effective teaching-learning process between teachers and students. The development phase was initially guided by us and then by the team of teaching faculty members on continuous formative evaluation process. Students were involved to give necessary and feedback about 'K-Share'. K-Share is developed to share learning materials for all the courses of our institution. Primarily, We have implemented it for computer science and engineering & information technology dept (CSE and IT). Most of the subjects are well suitable in nature to prepare electronic learning materials by the faculty of CSE & IT under our guidance and Subject Matter Experts (SMEs).

KNOWLEDGE SOCIETY

A number of factors influence a university's reputation. They include the quality of student enrolments, research awards, academic results and graduate employment rate. At the same time, a university may choose to focus its services on social equity, technology performance, classroom infrastructure and social infrastructure (IBM, 2002). In some ways, educational systems are like knowledge management (KM) systems; both involve the creation of useful knowledge from information (or) data found in available resources (Marshall,B., 2002). According to Ausserhofer,A. (2001), the rapid and continuous development of the information society into a 'knowledge society' is accompanied by two concepts, ' Knowledge management' and 'e-Learning'. E-learning and Knowledge management is of increasing importance in our society. Both the concepts work together to produce better results in education sector. Universities, as places where delivering an integrated entity of knowledge in a particular field of expertise should be the main aim, should focus their attention on curricular design, to offer program and courses, where previous knowledge of students could be logically and systematically combined with new ideas (Kiili,M., 2001).

K-Share is integrating knowledge management and e-learning technology to produce innovative and effective knowledge sharing environment for both teachers and students. The role of teaching faculty is to lead students to necessary information and knowledge resources. Students can get necessary assistance from any experts to solve their queries or problems in the case of virtual learning workplace (Kiili,M., 2001). Since most of the colleges are having very limited trained and qualified teaching faculty, our k-share system do focus the benefit of learners. According to Kiili,M. (2001), the traditional idea of young student attending lectures and seminars on a daily basis is not the usual solution for getting high education any more. This means offering wide-range knowledge sharing platform reduce their anxiety and improves their confidence in learning things much faster than traditional teaching environment.

KM Practices at higher education

If KM practices done effectively in education, it can lead to better decision-making capabilities, reduced 'product' development cycle time (for example, curriculum development and research), improved academic and administrative services, and reduced costs (Kidwell,J.J., 2000). According to us, the present challenge is to convert the information available with individuals and sharing it to other faculty, student and any other. According to Michael Fullan (2001) cited in Walshe,J. (2002) about the need of KM Practices in education is described as below,

- # Teachers have little time in the course of the day to get together to share ideas and refine their teaching
- # Teachers do not have habits of giving and receiving information
- # Cultures discourage such kind of sharing

According to Brown and Duguid (2000) cited in Adison Na Ubon (2002), universities have to adjust themselves and develop strategies to respond rapidly to the changes in technologies and increasing demands of stakeholders. Murray and Myers (1998) cited in Adison Na Ubon (2002) indicate that people's heads are reluctant to share their knowledge for fear of losing influence and control. As people leave, organizations have come to realize that they take with them valuable knowledge (Hildreth et al., 1999). According to Kitagawa, K. (2001), Awareness is an issue among teachers and students about KM and K-Share. When a lecturer leaves the parent organization for a new position, his or her know-how also disappears.

In general, people are reluctant to share knowledge the reasons include:

- # Not willing to share due to lack of time
- # Don't know about KM Practices
- # Lack of skilled mentor's
- # Lack of technology
- # Lack of fund to implement KM
- # Culture does not encourage Knowledge sharing

KM practitioner's advice the following steps for system development,

- # Identify the problem
- # Create the team
- # Locate the knowledge/information
- # Develop content for KM System
- # Create feedback mechanism
- # Integrate existing Info system

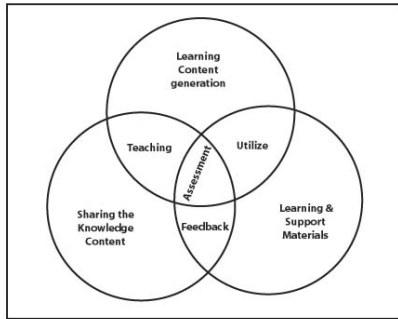
Traditional Classroom and ICT

In general, the learning process is depends on the involvement level of students and teacher in a traditional classroom. Students may come from different background and at the same time, teachers also need to update their knowledge (or) information perfectly. According to Mohammad Haitan Rachman (2001), processes of KM support the creation, dissemination and utilization of knowledge between individuals and groups. A well-structured knowledge repository can improves the flexible knowledge acquisition, sharing and application. The World Wide Web opened up new techniques for people to collaborate for learning and sharing new things.

Much of a community's knowledge lies within its documents, discussions, decisions, conceptual models, formal educational modules, processes, and the awareness by members of other members' expertise. For an academic professional society, community documents include books, journal articles, conference papers, audio tapes, videos, still pictures, course syllabi, and tutorials (Bieber et al., 2002). WWW Techniques are implemented here to develop effective k-share tool by linking and navigating those documents for better knowledge sharing platform among people. According to Newman, B. (1999), the general knowledge model organizes knowledge flows into four primary activity areas: Knowledge creation, retention, transfer and utilization.

A frame work for K-Share tool

A framework is proposed for developing a knowledge-sharing tool for higher educational institution. It consists of learning content generation, sharing of created knowledge content and identifying the learning and support materials. All the three elements are connected here by assessment. The element learning and Support material will be utilized to generate lecture content. The lecture content will be delivered to students after SME's evaluation. Lecturer may need to do some changes or modifications based on feedback from SMEs.



(Fig.1 A frame work for Our Knowledge sharing system)

According to Stephen Denning (1998) as cited in Carayannis,E.G. (2002) defines KM as the process for knowledge sharing. He also states the key dimensions to a knowledge program,

- # KM Programs have dimensions of collecting and connecting
- # KM Programs include social processes by which communities of practice enable knowledge sharing to take place
- # KM Programs support the maintenance of beneficial external partnerships.
- # KM Programs use IT to assist in knowledge creation and knowledge use (in addition to the most common aspect of supporting the dissemination of know-how)

Internet is the powerful technology for sharing the knowledge in the case of electronic learning. Computer software programs are being used in timetabling and school management to improve the use of staff time, student time and space, thus reducing costs significantly (Hildreth et al., 1999).

Knowledge sharing at all levels

According to Kitagawa,K. (2001), ‘knowledge should be created and shared with all members of the community.... knowledge is useless unless it is transformed into action or shared with other people’. Technologies such as Internet, intranet, video conferencing, and collaborative groupware allow members of community to capture and disseminate explicit knowledge. Course management systems such as webCT, and Lotus Learning Space, can be used for Teacher-student, as well as student-student interaction (Kitagawa,K., 2001). We have motivated our senior faculty members to work as subject matter experts to intervene and approve the learning content before delivering to students. They are integrated into Instructional Design to review all the content during the course of preparation. SME provides feedback to lectures for improving learning content if any changes suggested.

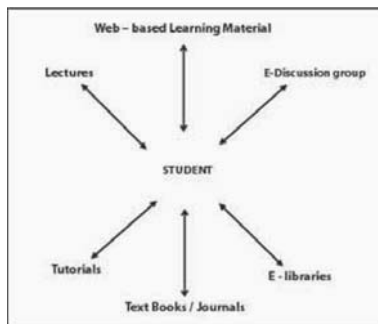
‘Higher education institutions have significant opportunities to apply KM practices to suggest every part of their mission,’ say many KM Practitioners. According to Milam ,John H (2001), E-learning is one of the most important KM practices, something which one would expect higher education institutions to have as an advantage. In the survey conducted by KM and IDC (2001), KM is recommended for Capture and share best practices (77.7%) and the companies adopt KM to retain expertise of personnel (52%) and the challenges to the implementation of KM is that employees have no time for KM (41%). (Source: Milam, John H., 2001). KM Researchers suggested that the new learning management system requires a different mind set about the teaching-learning process. The instructor must provide regular and meaningful feedback; ask for and consider student feedback; and create activities for student-to-student interaction (Carbonell,C.A., 2003). ICT support active learning experiences and support access to a wide range of media and learning opportunities. The challenge is that active learning experiences are expensive because it requires lots of work by the teachers (Sir John Daniel , 2001).

COMPONENTS OF K-SHARE

The purpose of K-Share is to improve student learning and outcomes in the field of higher education and to motivate faculty members to share the available knowledge within them. Faculty members develop learning material for students by using various IMM tools. SMEs and KM co-ordinator will formulate the guidelines to evaluate the lecture notes during preparation and then the lecture notes will be delivered to students through 'K-Share'. Our specific objectives are

- # To develop a collaborative learning system
- # To explore the knowledge expertise of faculty within institution
- # To propose a conceptual model for enabling web-based learning

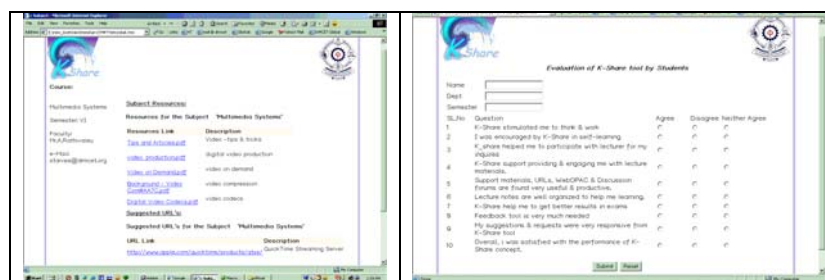
We refer the framework model of Smith,D. (2000),



(fig.2 , frame work by Simth,D.,2000)

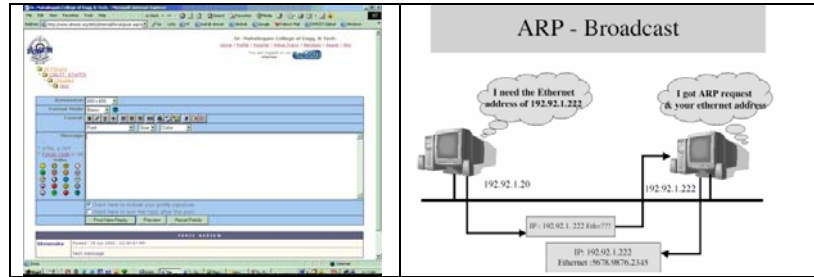
It is aimed to be a low-cost KM tool for every person. Individual faculty, students, staff, and other college/university citizens need access to simple, low-cost, interoperable KM tools. So that they can create and manage content/context for personal use and sharing (EDUCAUSE, Sept/Oct, 2003). To provide better teaching-learning environment, educational institutions must initiate knowledge management practices in their capacity to acquire, utilize and share knowledge by using ICT.

We did little modification in the questionnaire (Ref: KM Practices, 2001, Science, Innovation and electronic information division, CANADA) to suit our needs to ask our faculty members to give feedback about implementation of KM practices and after the benefit of k-share.



(Fig 3 and 4 : Screen shots of K-Share tool – an intranet site)

Faculties are motivated to give response for the given questionnaire (Annexure –I, II) and based on their positive feedback, K-share is designed as a web-based knowledge-sharing tool. Faculty members are motivated to prepare and host their lecture notes along with support materials (in the form of PPT, PDF, DOC and so on) and URLs for further references. Students do login to 'K-Share' and get a well prepared cum organized lecture notes and learning support materials during their course work in every semester. E-Mail, Discussion forum, WebOPAC and e-Books are add-ons in K-Share.



(Fig 5 and 6 – Screen shots from K-Share tool)

Intranet facility helps students to access k-share anything within campus. Feed back form is given for students to suggest the faculty if any.

Conclusions on improvements in Teaching-learning cycle:

The main objective is to integrate the knowledge management practices and e learning together for developing an effective knowledge-sharing platform between teachers and students for improving their self-learning attitude and academic performance. We aimed the following results by introducing this concept,

- # Consistency in Content delivery
- # Quality Content in Learning materials
- # Students self-learning concept
- # Performance improvement in the university results

We found remarkable improvement in all the above according to our best knowledge and data gathering from teachers and students. Data is collected from faculty members, SMEs and students of CSE and IT Dept using questionnaires, online feedback form, observation and interview.

Consistency in Content delivery: Students are very particular about the method of teaching practices in their respective area of study. Computer Science and IT Subjects are framed in the area of client-server, Internet tech, Computing, networking, Communications, Web Tech and multimedia and so on. In some cases, the syllabus of same subject is little modified for different groups of students in the field of CSE, IT and Computer Applications (CA) and in some cases, different faculty members handle similar paper for different group of students. Finally there is no consistency during the process of teaching of the same subject or similar subject. In K-Share, these issues are reduced by well-prepared and approved teaching support materials by subject matter experts (SMEs). Faculty members and students have given similar feedback about consistency in delivering lecture notes. This method helped them to get organized input during their course of study period.

Quality content in Learning materials: Supplement to consistency in delivering lecture notes, SMEs are requested to look into quality of preparation in lecture notes before delivering the same to student's thro K-Share. SMEs are appointed by Head of School and they are well experienced in teaching field. Faculty members are motivated to prepare the teaching material with proper explanatory, Drawings, Picture collection, references before submitting to SMEs. SMEs are verifying the quality of content in all respects and they suggest the faculty members about changes if any. Students have given satisfactory feedback about the improvements in quality content of lecture materials after using K-Share. In traditional classroom environment, both faculty members and students due to various known and unknown reasons do not effectively rate most of the lecture hours. K-Share provides environment to organize lecture notes along with support materials. Faculties are benefited because they need less preparation time to deliver the same course in next time compare to their earlier stage. Faculties are delivering well-prepared lecture materials with expected quality level. They expressed their views that self-learning attitude is quite improved among students because of consistency and quality in Teaching-learning process.

Motivation for self-learning: K-Share motivates students to use the various add-ons in addition to their lecture notes. At every subject page, mail and discussion forum are given for interaction between student-student and student teacher. K-Share provides online feedback form to students to explain about overall functionality of the system. Faculties are observed and found from students that the self-learning attitude is improved among many students by using K-Share. Students found their convenient time at their place for downloading lecture notes and teaching support materials for self-study. They gave encouraging feedback to faculties thro discussion forum and mail to add more reference materials, project tips, question bank in addition to lecture notes.

Improvements in university exams: Academic results are improved at very satisfactory level. Academic results are generally depends upon question paper setting (by university), writing presentation of students (at university exam) and input from faculty members (at respective college level). Internal marks are awarded by colleges (20%) and university awards remaining 80%. So results are more concerned by faculty as well as students in this set up. In the year 2002-2003, few of them only awarded with pass exams (20%) by university, Tamil nadu, India. Many faculty members and educationalists analyzed the reasons for such poor result achievement. They found various reasons that introduction of new syllabus, non-availability of proper books at colleges, lack of experienced faculty members, Poor teaching support materials, non-availability of time to complete portion on time (rushing or skipping contents), irregular teaching method, inadequate infrastructure, vast syllabus and so on. In all the above reasons, we consider one of the main reasons is lack of quality and non-consistent lecture material delivery from faculty side. Preparing and sharing standard teaching-learning material from faculty side to students can avoid this. K-Share is aimed to serve this purpose since year 2003. We observed that it is working well. This KM Practice is now developed horizontally to all other faculty members from few of them. We got very good response from both side and resulted in good academic performance (80%) in university exams according to our findings (Source: Anna university results in 2002-2003 and 2003-2004).

Acknowledgements

We appreciate the active participation from faculty members of CSE and IT dept, to develop K-Share suite since year 2002. The project is fully funded by the management of institution.

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Annexure I

Questionnaire to understand views of faculty members to implement KM Practices in Dr.Mahalingam College of Engg and Technology.

Reasons for using KM Practices

(Modified from Source: KM Practices, 2001, Science, Innovation and Electronic Info Divn, Canada)

Sr No	Questions	Important	Somewhat Important	Not at all Important
1	To improve the competitive advantage of your institution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	To help integrate knowledge within your institution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	To improve the capture and use of knowledge from sources outside your institution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	To improve teaching-learning process by using knowledge sharing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	To protect your institution from loss of knowledge due to lectures' departures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	To train young teaching faculty to meet objectives of your organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	To improve faculty retention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	To identify and/ or protect the knowledge present in your organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	To promote sharing or transferring knowledge with other educational institution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	To reuse the knowledge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Annexure II

Questionnaire to faculty members to understand their experience in using K-Share Tool

(Modified from Source: KM Practices, 2001, Science, Innovation and Electronic Info Divn,Canada)

Sr No	Effectiveness of Results of using KM Practices	Agree	Disagree	Neither Agree Nor Disagree
1	Knowledge sharing practices are increased horizontally (to all other faculties)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Increased our knowledge sharing vertically (to the organizational hierarchy)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Improved students' academic results	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Improved knowledge and Learning attitude of students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Helped us to add few more tools in k-share	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Increased flexibility and productive in preparing lecture notes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Helped us to work more in finding support materials and URLs for reference	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Prevented non-standard (or) un-similar lecture materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Helped young faculty to use standard lecture materials for their class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Improved students' involvement in continuous assessment activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Sachdev, M. University of Sydney. Australia. Social Perspective of India's Higher Education System

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In 1991, the Indian government began to open its economy to foreign investment as a reaction to the financial crisis of the 1970's and 80's. As a result, economic reforms that took place in 1991 ultimately forced changes to the higher education system. As India's higher education sector accepted the liberal economic transition, it defined its role narrowly by embracing the new trends of the information technology (IT) sector. Subsequently, this allowed the middle class to take advantage of their position in the Indian society to increase the gap between itself and people of lower classes, lower castes and women.

This paper will explain how the Indian government responded to the conditions and recommendations by the World Bank and how the middle class influenced this response. The discussion will begin by looking at how the middle class has been able to utilize the World Bank plan's to 'leapfrog' (Miller 2001) India into a modernized nation for their interests. While at the same time displacing people of lower class, lower castes and women in a position of 'underdevelopment' (Mittlemen 1997). The analysis will then look at the emergence of the new middle classes ability to shape the Indian government's restructuring of the higher education sector to not only provide IT training facilities, but also to secure the access and availability to itself.

INDIA'S FINANCIAL CRISIS:

The financial situation in India during the 1970s and 80s was less than successful. According to the IMF, the economic crisis in India was due to her dependence on borrowed money at commercial rates while along with remittances of nonresident workers, had created a shift in confidence in investors. India's debt had increased significantly from the mid 1980s to the beginning of the 1990s. As stated by a IMF Staff Paper, India's external debt nearly doubled from approximately \$35 billion at the end of 1984/85 to \$69 billion by the end of 1990/91, medium- and long-term commercial debt had also increased from \$3 billion to \$13 billion during the same period, and the stock of nonresident deposits increased from \$3 billion to \$10.5 billion (Cerra, 402).

The Indian government attempted to restructure her economy during the mid-80s during Rajiv Gandhi's statute as Prime Minister, by attempting to liberalize. In an attempt to increase chronically low productivity of the industrial sector, the administration began to reduce the degree of domestic regulation. This signaled a move away from physical controls to financial control, leading to more focus upon the private sector easing the trade policies to improve its access to imports and even capital goods for overseas investors (Ahluwalia, 7). However, the Indian government's attempt to industrialize and liberalize its markets and society on its own only provided a small increase in the domestic output during the 80s. As a result, the attempt by the Indian government to liberalize the economy was not enough to rectify the financial crisis it had found itself in. Therefore, the Indian government's only choice was to accept the liberalization process in 1991 as laid down by the World Bank, to open up its markets and to agree to structural adjusted loans under stringent World Bank conditions.

Besides providing financial contribution to India, the World Bank also provided consultancy to assist India's road to development. Reports by the World Bank focused on India's ability to forgo its attempt to industrialize the nation, and to move ahead, or 'leapfrog', with the use of IT strategies towards becoming a knowledge-based society. The idea behind "leapfrogging" was a term coined by Robert Miller in 2001, in his report 'Leapfrogging? India's Information Technology Industry and the Internet', which is a World Bank report. In the past decade the information technology sector has been

pushed by international organizations as the market that will allow India and other developing nations to increase their competitive economic production on the global economic scale. The advancement of the information technology era is seen as a 'new age' where a nation's ability to meet the challenges of this sector will shape their economic and social future (Garrhiy, 1997). In the case of India, the idea of 'leapfrogging' was being utilized by international organizations well before 2001. The focus after independence by Jawaharlal Nehru was to develop the nation by building an infrastructure around industrializing the nation. However, due to the lack of positive results over the past four decades, economically and socially, the Indian government decided to take advice, in addition to conditions, from the World Bank and attempt to "leapfrog" the Indian society towards becoming a knowledge-based society.

The use of information-communication technologies is the main component towards becoming a modernized nation. According to United Nation report titled, Knowledge Societies: Information Technology for Sustainable Development, a knowledge-based society places emphasis on a nation's ability '...to add value using information-communication technologies products and services' to generate wealth (Mansell, 15). More specifically, the knowledge-based society is based around sharing knowledge around the world on a wide range of social, economic, and environmental problems (Mansell, 242). However, before any of this can take place, 'ICT strategies should begin to be visible in new sources of employment and the potential for... working and organising the production of manufacturing and services' (Mansell, 242). In other words, for a nation to succeed in a knowledge-based society, they must not only incorporate IT strategies in the management and communications of the economic sectors, but also within the social sectors.

Yet, as promising as the suggestions have been by the World Bank and the United Nations, the question arises, is the transition towards becoming a knowledge-based society the answer for India's past problems towards becoming a developed nation? Pohjola asks, 'Could IT provide poor countries with the short-cut prosperity by allowing them to bypass some phases of development in the conventional, long-lasting and belt-tightening process of structural change from an agrarian to an industrial and, ultimately, to a knowledge-based services economy' (Pohjola, 1-2)? Based on statistics from 2001 by the World Bank, there are 433 million people living on less than US\$1 per day in India, which includes 36% of the total poor in the world (World Bank 2001). As a result, one-third to one-half of the population of India is still below the poverty line and in a state of 'underdevelopment' (Mittleman, 1997). The state of 'underdevelopment', according to Mittleman,

'...refers to the blockage which forestalls a rational transformation of the social structure in Third World countries: rational not in the commonsensical meaning that the options are deducted from reason alone, or in the bureaucratic sense of a neat adjustment of means to ends. Rather, rational in that the interests and needs of the majority are increasingly dominant. What blocks development is an internal and external constellation of power and privilege' (Mittleman, p. 25).

Despite the assistance from the World Bank and the transition towards becoming a knowledge-based society aimed at assisting India into becoming a modernized nation, majority people of lower class, lower caste and women find themselves being pushed further away from receiving the benefits. Modernization may occur in India with the adoption of the IT sector and its applications, but only for the 'power[ful] and privilege[d]', which in India's case is the middle class and above. Instead what has occurred is the creation of a middle class who believes in a non-welfarist, private and commercialized economic structure within the Indian society (Vora, 284).

EMERGENCE OF THE MIDDLE CLASS:

What is ironic of the World Bank and international community's assistance in India, is that the launching of the knowledge-based society upon the people of India has only brought success and benefits to the people of middle class and above. Before liberalization of the economy, the structure of the Indian society was based on the caste system. Where traditionally the role of the higher castes, which are based on hereditary rights, were to focus their time and energy on studying Hindu rituals

and to provide spiritual guidance to the people within the community; while the role of the people in the lower castes were to take care of the community and to fulfill the necessary duties for the community to run efficiently. However, since liberalization officially took place in 1991, the socio-economic priorities have shifted towards a more economic status, which has ultimately caused a shift in the rules of the caste system. More importantly, before liberalization, there was a significant gap between people of the upper castes and people of the lower castes in terms of access to services and resources. And now as the economy and society has shifted towards becoming a knowledge-based one, people of lower caste, as well as people of lower classes and women, find themselves being left behind and in some circumstances being pushed away from reaching the necessary services and resources for survival. As a result, the creation of the knowledge-based society has increased the gap between the haves and the have-nots.

People of higher castes were and continue to be in a position of economic and political dominance due to their access to resources and services, such as 'food, shelter, health and education' (Dutta, 2). As explained by Sheth, what this shift has created is a middle class that is almost exclusively people and groups of the upper castes. 'Increasingly, they have been advocating such policies for the state as can meet the aspirations of the articulate middle class, which, by and large, comprises the upper castes' (Sheth, 61). The ability of the upper castes to dominate the middle class has allowed a wedge to stand between the middle class and people of lower classes, lower castes, and women. As a result, while the people of the middle class enjoy the freedom to take advantage of resources and services, the less fortunate are subjected to live a life that is out of their control. As stated by Dreze and Sen, the less fortunate do not have choices or opportunities, which are essential components of the middle classes position. 'Thus, the notion of capability is essentially one of freedom – the range of options a person has to deciding what kind of a life to lead. Poverty of a life, in this view, lies not merely in the impoverished state in which the person actually lives, but also in the lack of real opportunity – given by social constraints as well as personal circumstances – to choose other types of living' (Dreze and Sen, 11). Accordingly, what has resulted is a new middle class that encompasses everyone except the poor (Lele, 203).

As complex as the caste system is to understand, the transition to the liberalization of the economy in 1991 has opened up the debate to what affect the caste system has on the socio-economic structure in India. Because the economy began to open up to foreign and domestic competition, so to did the traditions of the socio-economic caste system. And one of the ways the socio-economic structure has changed in India has been in the view of success. The view to success is not to aspire to the lifestyle and culture of the Brahmins, the highest caste, as it was before liberalization. According to Vora, success and the inspiration for the less fortunate is to gain access into a lifestyle and culture that follows the beliefs of the middle class, which includes privatization and globalisation, to be self-interested, a consumer, pragmatic, and competitive (Vora, 284). However, with these beliefs also comes an attitude by the middle class to safeguard their position within the socio-economic structure by upholding views against backwardism, redistribution, egalitarian policies and social welfare programmes (Vora, 284).

As a result of this shift in the structure of the caste system, the middle class felt threatened by people of the lower castes. Therefore, the middle class began to place an emphasis on directing the route of the higher education reforms after 1991. Evidence of this was observed and commented on by an Education professor at a tertiary education institute in India on March 2003.

'There is a whole concept which has come into education, who have got education today, they are new Indian middle class, empowered by new money, by new views of what India is. This middle class is not taking very well to the changes. I think they are more aggressive, very conscience of an identity, and in some sense very anxious of the things, which are changing from below. What is changing from below is the rise of the lower castes. It is very tense about that...And so all the middle class characters have changed. And the old middle class is very tense about it, they still constitute the majority of the middle class, and a great deal of anxiety whenever there is uprooting' (Professor Grewal 2003).

The threat to the middle classes dominance, economically and socially, has led to continual pressure on policy decisions to benefit their position.

The middle class has empowered the Indian government to transition the Indian society towards a knowledge-based society, by projecting their beliefs upon policy decisions at the government level. The middle class has been able to do this because of the economic power they accrued after the economy liberalized in 1991. It has allowed the capitalist-rich, regional bourgeoisie, middle class to combine with the world capitalist system and the global information technology sector, to expand their economic power (Mohanty, 109). Because liberalization of the economy follows the belief of dismantling government's involvement within the private sector, the middle class were in a position to influence economic and higher education policy decisions based on their beliefs, privatization and globalization, to be self-interested, a consumer, pragmatic, and competitive. This has ultimately allowed the middle class to oversee the reforms made by the Indian government within the higher education sector to demand and dominate the access and availability of training facilities for the IT sector.

RESTRUCTURING THE HIGHER EDUCATION SECTOR:

Higher education in India was established to provide all people of India, regardless of their background, religion or gender with support, access and tools to harness their potentials to increase their socio-economic position. However, as the traditional socio-economic structure, the caste system began to become more economically based, so to did the higher education sector. Because this new socio-economic structure was based on one's economic position, the middle class became the dominant influence on society and politics. And this process was greatly hastened by the economic reforms of 1991. As a result, the middle class has been able to continue to utilize the support, access and tools of the higher education to further the distance between itself and people of lower class, lower caste and women. This has been done by supporting the government's reduction of financial responsibilities of the higher education system, backed the World Bank's recommendations to allow privatization, and support the Indian government's decision to continue providing unconditional assistance towards technical education.

Reduction of financial responsibility by the Indian government:

Since independence in 1947, the Indian government, centrally and at the state level, took on the sole responsibility to provide tertiary education to the people of India. However, as tertiary education began to expand and increase, the Indian government continually found itself unable to provide financial contribution towards sustaining and developing the tertiary education sector. According to Sadgopal, the Kothari Commission (1964-66) recommended to the Indian government that 6% of the GDP was required for the higher education to succeed in India. However, as the years have gone by, that goal as failed to reach and catch up to the required recommendations by the Kothari Commission.

'Since independence, the successive Governments have refused to re-prioritise the Indian economy to make the necessary investments in education. Instead of reaching the level of investment of 6% of GDP by 1986, as advocated by the Kothari Commission [1964-66], we were spending only 2.5% by that year. Only half of this investment is in the elementary education sector, the remaining being for secondary, higher and technical sectors of education and some other special schemes. The investment in education rose to about 3.9% of GDP by mid-nineties but fell down to 3.4% by the end of the century. This means that an ever-widening cumulative gap of investment in education has been building up for more than three decades' (Sadgopal, 36).

This argument of the 'cumulative gap', established by Sadgopal, explains that the financial resources by the central government has never reached 6% of the GDP that was suggested, by the Kothari Commission. Therefore the Indian government has never met the required amount of money that was required to provide the education system, elementary, secondary and tertiary, with enough financial

resources to succeed. As a result, due to the lack of money that the education system has received since 1964-66, there has been a continuous and growing gap accumulating over the years, which continues to this day. Due to this, the education sector, in this case the higher education sector is in dire economic condition. According to UNESCO, the share of higher education in total planned resources increased from 0.71% in the First Five-Year (1950-55) plan to 1.24% in the Fourth Five-Year Plan (1965-1970). However since then it has decreased to 0.53% in the Seventh Five-Year Plan (1980-1985) and further down to 0.35% in the Eighth Five-Year Plan (1985-1990). Even though the total expenditure has increased more than 100 times from Rs. 140 million in the First Five-Year Plan to Rs. 15,000 million in the Eighth Five-Year Plan, this investment is well below what is required to succeed (Joshi 1998).

Privatization:

The Indian government realization that they would not be able to initially support the financial responsibilities of the higher education resulted in their support of the beliefs of the middle class to privatize, commercialize, and promote courses that are market-oriented. These new factors to the higher education were put in place to provide financial assistance to the tertiary education sector. Therefore, the continued pressure to reform the structure of the higher education sector allowed the middle class to take advantage of the access and opportunities that were not affordable by the less fortunate. If higher education institutions become privatized and focused on the market, then fees and costs of tertiary education will increase. As a result, the only people that are able to gain access to private and commercialized education institutes will be people from the middle classes and above. By promoting these characteristics in the higher education system, the middle class takes the responsibility of providing equal opportunity of access and services of tertiary education, to a system where the only courses available are ones that are based on the trends of the market.

Although privatization of higher education institutes was supposed to assist the Indian government of their financial responsibilities, in actuality some private institutions have placed the Indian government in a worse economic position. An issue that requires explanation is to discuss the different types of private education institutes and colleges located in the tertiary education sector. According to UNESCO, private colleges account for approximately three-fourths of the total number of colleges, of which are of two types. One is privately managed but publicly funded these are known as (government) 'aided' colleges. While the second type is privately managed and funded colleges, these are known as 'unaided' colleges (Joshi 1998). However, as investigated by UNESCO, thus far the 'aided' private colleges '...receive government aid to meet almost the whole recurrent expenditure. The private aided colleges have not contributed significantly to easing the financial burden of the government, as more than 95 per cent of the recurring expenditure, and sometimes even the capital expenditure, is met by public exchequer. Hence strictly from the point of view of finances, such private colleges do not have any significant role' (Joshi 1998). Not only did these 'aided' private institutes not reduce the financial burden of the government within the higher education sector, some of these same institutes also charged fees to make profits, of which is rarely reinvested back into the education (Joshi 1998). The assistance provided by the government to these private institutions illustrates that the middle classes willingness to pay for an education was not to assist the Indian government's financial situation, but in actuality to use the system to further the gap between itself and the less fortunate.

The pressure on the higher education system to transition towards providing the facilities and teaching for an IT sector, forced the Indian government to open up the higher education sector to private institutions. However, the higher education system was initially unprepared to provide policy guidelines for private institutions in the IT sector. Due to the pressure by the both the middle class and the World Bank, the Indian government did not have much choice but to reform policies in the 1990s. One in particular was the establishment of a pathway and guidelines to private training institutions. The Department of Electronics (DOE) placed a scheme, the DOE Accreditation of Computer Courses (DOEACC), which was '...to impose some discipline and standards on various levels of private training institutions, and at the same time, provide alternative channels for consumers (trainees) to advance their careers and achieve market-recognized levels of proficiency' (Nagy 1994, 71). As the

Indian government passed some of its responsibilities of providing training to private institutions, they continued to be under pressure by the World Bank and the middle class to modernize public technical education facilities, to train the necessary manpower to successfully transition towards becoming a knowledge-based society.

Technical education:

From the time Jawaharlal Nehru was the First Prime Minister of India, the higher education system, specifically technical education, played an important role in training the required manpower to fulfill the industrial needs of the nation. At present, the Indian economy has shifted from an industrial infrastructure to a knowledge-based one, and technical education is once again looked upon to train and provide manpower. However as stated above, the Indian government was initially unable to provide the necessary financial and training resources that would alleviate the demand for IT training. As a result, the World Bank provided financial and consultancy support to India's technical education sector. Technical education is the only field within the tertiary education sector to have gained any financial support by the World Bank. The World Bank's assistance within technical education began in 1990, the first of three Technician Education Projects. The first one began in 1990, which lasted until 1998, the second project duration was from 1991-1999, and the third project is from 2000-2006 (World Bank website). The projects focused on policy reforms, institutional development, and new technology and training approaches. Yet, as the World Bank and the Indian government continue to support technical education in the view that it will assist the nation to develop into a modernized nation, in reality the people of the middle class and above are the ones who have been able to receive the majority of the benefits of the transition towards becoming a knowledge-based society. This is evidenced in a study conducted at the National Institute of Educational and Policy Administration (NIEPA).

According to a study done in 2003, by Ranjana Agarwal, a Research Assistant at NIEPA, the middle class are amongst the majority of people with elite backgrounds who have the resources and access to training facilities in the IT sector. She began her study by investigating whether the IT sector is an equal opportunity provider (Agarwal 2003). As stated in her study, due to the specialty of the IT field majority of the people who dominate the IT sector have had adequate pre-service training and are with elite background products of private English medium schools'. The data reveals that 79 percent of respondents, 94 percent of women and 64 percent men have studied in English medium schools. While at the same time, 72 percent of the respondents, 80 percent of the women and 64 percent of the men have studied in private schools. More so, factors such as parents educational career also plays into the factor of the respondents 'elite background'. Ninety percent of the respondents have fathers who have graduation and above levels of education, 39 percent of them have professional qualification, 15 percent have a postgraduate degree and 7 percent have a doctorate degree. Additionally, 56 percent of the women respondents are children of doctorate / professional fathers compared to 36 percent of the men. The same scenario is found with the women's mother's educational background. For 70 percent of the respondents, mother's education level is more than graduation and above. This study conducted by Agarwal, clearly illustrates that the middle class are amongst the majority of people with elite backgrounds who have the resources and access to specific higher education training to enter the IT field and to reap its benefits. While at the same time, people of lower class, caste and women continue to be obstructed to gain a tertiary education that is relevant to their needs, because the bulk of the emphasis in higher education is spent in technical education. This is evidenced in the amount of attention technical education receives in the Indian government's Five-Year Plans and Annual Reports.

The Indian government as early as the Rajiv Gandhi administration in 1984 gave attention towards to the IT sector, then known solely as the software industry. Under his administration, reform policies were implemented (Saxenian, 2002), such as the Computer Policy of 1984 and the Software Policy of 1986, and software was registered as an 'industry' making it eligible for an investment allowance and other incentives' (Saxenian, 2002). However, not until the IT sector had been established by the international community as the means towards development, in addition to the liberalization of the economy in 1991, did the information technology sector in India gain momentum.

As a result, since 1991, emphasis within higher education policy reforms has focused around how to support the IT sector. Even though the central government had reduced financial responsibilities for the higher education sector, one sector they continued to support is technical education. As pointed out in the Eighth Five Year Plan, '[t]echnical education...is one of the most potent means for creating skilled manpower required for developmental tasks. While this implies high costs of construction, laboratory equipment, library books and journals and high rate of obsolescence, such high cost, being directly related to development, should be viewed as an essential productive investment, yielding valuable returns to the society' (Government of India 1992-97). This continued support for technical education, specifically the IT sector, has created world-class manpower, while at the same time sacrificing financial resources and facilities to reduce the gap between the haves and the have-nots.

One of the first steps towards shifting the main agenda of the higher education system towards establishing manpower for the knowledge-based society was setting in place a strong infrastructure. The planning commission responded to the higher education systems new role as a 'catalyst' (Nagy 1994) for the IT sector within the Ninth Five-Year Plan (1997-2002), where it states:

'[t]he country is going through major economic and technological changes. The system of higher education has to prepare its products for participation in the emerging social, economic and cultural environment. Universities are witnessing a sea change in their outlook and perspective. Information technology is leading to fundamental changes in the structure, management and mode of delivery of the entire educational system' (Government of India 1997-2002).

The Indian government response to establishing an IT infrastructure directed to the 'economic and technological changes' was by providing unconditional support to the Indian Institutes of Technology (IITs) as 'centers of excellence in informatics and software engineering' (Nagy 1994, 66), which was suggested by a World Bank report in 1994.

The IITs have been an important player of India's transition towards becoming a knowledge-based society for the past decade in India as well as abroad. The IITs were set up as Institutes of National Importance to be premier centers of education and training in applied sciences and engineering (Government of India 1994-95, 8.2.1). The IITs have been put in position by the Indian government to concentrate '...on technology assessment and forecast so that futuristic approaches could be re-oriented to take up the development of emerging Science and Technology trends in the country' (Government of India 1994-95, 1.2.15). The goal was to set-up a strong foundation, with global quality. However, at present there are only six IITs throughout India therefore allowing a small population of students who are able to gain the benefits of these institutes of 'excellence'. Hence, the Indian government decided '[t]o develop horizontal and vertical linkages with other institutions, research laboratories, industry and user agencies through multiplicity of programmes including consultancy' (Government of India, 1999-2000) in order for additional institutions, such as polytechnics and regional engineering colleges to gain consultancy and support to provide high standards of technical education throughout the nation. The support and emphasis placed on the IITs have allowed them to excel, but only for a small population of the 'elite' middle class who has had the proper background, as suggested by the Agarwal study, in addition to tuition fee money to gain access to these 'centers of excellence in informatics and software engineering'.

The field of IT is a highly specialized field of 'mathematics, management, computer science, electronics engineering, and other engineering sciences' (Nagy et al.1995, 21). Specifically the IT industry consists of people to '...involve the handling of information by electronic means: that is, information acquisition, storage, retrieval, processing, transmission and control' (Nagy 1994, 1). This new workforce is considered as the international division of labour (NIDL) (Sommers et al., 21) for the foreign and domestic IT markets that have opened up in India. And due to the transition of the Indian economy from an industrialized society to a knowledge based one, the higher education system

has once again come under pressure by the Indian government and industry companies, to create and train manpower for the IT sector.

SUCCESS OF THE INFORMATION TECHNOLOGY SECTOR:

The emergence of the information technology (IT) sector has allowed the middle class to financially succeed and continue their supremacy within the socio-economic stratum after 1991. One of the main reasons why the IT sector has become a major asset to the middle class is because the policies recommended by the World Bank and various international organizations have upheld the beliefs and needs of the middle class. The World Bank's recommendations emphasize for India to 'leapfrog' its attempts to industrialize the nation and move towards a knowledge-based society. With this in mind, higher education in India has therefore been required by the middle class to change its focus from providing the manpower for an industrializing nation, to utilizing information technology for development. This new manpower is known as the NIDL, which allows India to integrate into the global economy and bring the middle class economic prosperity.

In total, the pressure from international organizations and middle class, foreign assistance within technical education, and policy reforms in the economic and higher education sector has produced IT manpower unlike anywhere else in the world. As of 2001-02, the number of software professionals has increased from 6,800 in 1985 to 522,050 (NASSCOM as cited in Agarwal, 620). With the increase in the number of IT manpower in India, economically the IT sector has increased significantly within India during the past decade. A significant period in the development of the Indian IT industry has been the ability of the Indian manpower to assist companies around the world in their attempts to resolve the issue of the Y2K situation that had caused a world-wide programming concern before the year 2000. As noted by an IT professor interviewed at an IT higher education institute on October 20 2003. 'And the change actually occurred in the perception of the customers towards the India IT professionals at the Y2K time. And when the Y2K problem was there, people expected these people to fix bugs, fix the Y2K bug, but they did a lot more. When you look at trying to fix a bug, you have to improve systems, and not a much higher cost' (Professor Kapila 2003). The success gained by moving upward in the value chain, IT companies, foreign as well as domestic, began to view the manpower in India as world class. This led to the economic surge of the IT industry in India within the 90s. 'In the six years since 1994-1995, the output of India's IT industry has surged from a total value of US\$2 billion to US\$8.7 billion in 1999-2000' (Vicziány, 1).

One of the main components to the success of the IT sector in India has been due to the involvement of the National Association of Software and Services Companies (NASSCOM) within government policy decisions. With NASSCOM's involvement, the IT industry has been able to push past the bureaucratic intervention and red tape that has been associated with Indian industry's before the liberalization of the economy in 1991 (Vicziány, 10). This has led to an increase in the number of qualified manpower available for the IT industry in the past decade. Data from the Ninth Five-Year Plan (1997-2002) has shown that there is estimated 10,000 technical graduate per annum, in the diploma courses there are 170,000 graduate yearly, Postgraduate and Doctoral programs in engineering are available in 150 institutions, and about 60 polytechnics offer advanced and post-diploma courses (Government of India 1997-2002, 3.3.27). According to Vicziány, there has been an increase of the number of institutions teaching courses related to the IT area from 1,904 in 1998 to 2,860 in 2000, producing approximately 122,000 graduates (Vicziány, 22). In addition to the number of institutions that have increased over the years due to the assistance of international organizations and NASSCOM, the IT infrastructure has been modernized with 800 laboratories and 550 projects were undertaken to strengthen technology areas (Government of India 1997-2002, 3.3.52).

With the changes in the higher education system, the IT sector has accrued enormous economic at the domestic and global level, however it has yet to contribute significantly to the real needs of the people of India, the social sector.

TODAY:

The success of the IT industry at the economic level, from 1991-2001, in India has come at the expense of many changes that have taken place at the higher education sector. Not only has the focus of tertiary education adjusted to the new needs of the economy, but also who and what organizations have the ability to influence policy decisions have affected the system. As a result, professors within various higher education institutes have stated their concerns of the future of the system. The following is a statement by an Education professor in response to the changes in the higher education system in India since 1991.

‘Now the traditionally, many of us used to think, rather look at education as more of socialization, cultural transmission, and personal, cognitive and social development, as well as general preparation for employment. This is how we used to look at it as a nation right from the beginning. Now global actors, like the World Bank, the International Monetary Fund and the World Trade Organization, they have been playing a significant role, in changing the concept of education in the form of privatization and commodity of education... These are key to making education tradable and profitable to private interests, it is not a common interest. Now with the growing commercialization of education, the values of the marketplace are gaining momentum and our traditional values are taking a backseat. One of the main factors is the change in the societies attitude towards education, which is now seen as a private good benefiting those who study or do research’ (Professor Roshan 2003).

The concern stated by this professor of the state of higher education in India is not unfounded. The changes made to the higher education sector have been made to ultimately support the IT sector in its outline to develop a knowledge-based society. But who has gained the benefits from the success of the IT sector?

The focus of this paper was to illustrate the command of the middle class on policy reforms in the Indian higher education system post-1991. The middle class was able to utilize the assistance by the World Bank, and various international organizations, to benefit their economic and social dominance within the Indian society. The pressure by the world bank to establish a knowledge-based society and “leapfrog” economic and social issues left unfinished during the industrial state, was in actuality seen as a window of opportunity to further displace the middle class from people lower class, caste and women. As the IT sector began to play a significant role within the Indian economic sector, the higher education sector was forced to fulfill the required manpower and technological needs of the new knowledge-based society. As a result, the higher education sector has changed drastically over the past decade to fulfill the needs of the economic market rather than providing training and assistance to all groups of people, regardless of their caste, class or gender, with an opportunity to gain economic and social prosperity.

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ABSTRACT

Science and technology in the 20th century largely overcame space and time we live and enhanced our lives and academic knowledge, but science and technology caused negative consequences on the other hand. The challenges in the 21st century should deal with these problems. One of the most important functions of higher education is to cultivate rich and multi-faceted human competence and abilities for contributing to solve these tasks. E-learning can be useful and effective for this purpose. This paper describes the characteristics of e-learning in the network learning community and shows the present state and future prospect of e-learning in Japan. The e-Japan strategy statement II, the e-Japan Priority Program 2003 and 2004 stressed the importance of 'Achievement of Human Resource Development, and the Promotion of Education and Learning' and placed high value on the key word 'e-Learning'. In the near future, e-Learning would become education in general and the traditional face to face education in universities and schools as well as distance education would be only a specific part of education respectively. Education consists of the state of affairs where learning objectives are achieved through learning by interaction between learners and information resources. Any member of our society would become learners and learn any content anywhere anytime via any curriculum, any method, any learning media, any learning style etc. The spread of e-learning will influence university education by the participation of various educational providers such as corporate, organization, educational business, etc. There the quality assurance on the courses, degree, diploma, certificate, content, website, system, organization, etc. would be important. New type of university leaders would deal with these situations effectively, whom society must enhance by university education reform.

SCIENCE AND TECHNOLOGY

The science and technology of the 20th century have brought us into a new knowledge and information-based economy in which we can overcome space and time on a massive scale, reform the ways in which we conduct our daily lives, and expand our understandings of the world and ourselves. However, these scientific and technological advances have also had negative consequences on our world and on a scale never previously known to humankind.

TASKS OF HUMANKIND FOR SUSTAINABLE DEVELOPMENT

The challenges facing us in the 21st century lie in finding ways of using science and technology to solve these problems, to achieve development that is truly sustainable, and to promote the advances and right the wrongs that are needed across the globe. Firstly, we need to develop more advanced technology by which new energy resources can be developed, the living environment can be expanded, restored, and enhanced, environmental pollution can be eliminated, the technology of recycling can be progressed and new food, health and medical benefits can be achieved. The second strategy must be to protect the destruction of the global environment by preserving our natural environment, improving our man-made environment, and conserving energy resources and water and food supplies. The third critical strategy will need to be concerned with managing and sharing resources more equitably and openly across all communities and regions on earth, respecting human rights, achieving international solidarity and multicultural and multi-racial symbiosis and coexistence. Only through these means can human security be realized.

To implement all of these strategies calls for the cultivation of greater human wisdom, the development of a deeper understanding of culture, ethics, history, politics, economics, and the adoption of a worldview on these issues, not a partial or parochial one.

ROLE OF HIGHER EDUCATION

One of the most important functions of higher education is to cultivate rich and multi-faceted human competence and abilities in solving these large-scale problems that we now face. To this end, higher education will need to implement structural and curricular reforms in three main regards. Firstly, our institutions will need to create and promote scientific and technological development that is attuned to the needs of a multi-cultural, multi-value and symbiotic society and aimed at problem-solving on an international scale. In order to do this, our institutions will need to be sensitive to global politico-economics and the needs of international development. So the second aspect of institutional transformation must be the training of intellectual and technological specialists together with international relations and development specialists. These specialists need to be capable of developing and applying science and technology with both historical and forward-looking politico-economical understandings. The third important reform will be to educate the public in terms of the liberal arts, ethics, and inter-personal, inter-cultural and international understanding and respect.

EXPECTATIONS OF E-LEARNING

E-learning is invaluable to implementing strategies for sustainable development and higher education reforms. E-learning enables students and scholars to communicate and collaborate across societal and international boundaries. It enables the developed world to provide information, learning resources, and services to the developing world. Conversely, it also allows the developed world to listen to and learn from other cultures and indigenous communities. E-learning is the means by which information, intelligence, and innovation can overcome the forces of intolerance and inequity which damage our planet.

SIGNIFICANCE OF E-JAPAN STRATEGY

In July 2003, the Government announced its e-Japan Strategy Statement II. The IT Strategy Headquarters' e-Japan Priority Policy Program-2003 was made public in August 2003. The program is part of the Government's strategy to raise Japan into the top of group of advanced IT nations by 2005 and to foster continued innovation to sustain this status from 2006.

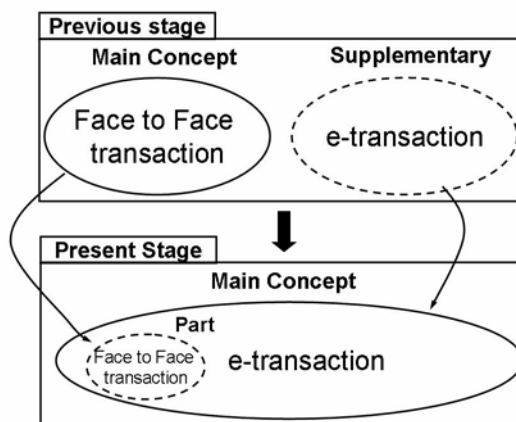


Figure1: Change of Main Concept in Contemporary Society
Bank transaction and reservation

The program stressed the importance of 'Advancement of Human Resource Development, and the Promotion of Education and Learning', the second policy area of five areas given priority. With this policy, the Government places high value on the key word 'e-Learning' along with other key concepts such as electronic government (e-Gov), electronic local government, electronic commerce, and electronic loans collection.

How significant is this e-Japan policy? 'Electronic bank transaction' and 'electronic reservation' are now expressions not used in everyday speech, as of course is quite natural. After all they are business transactions which have been conducted electronically for some time. Indeed, these days it is hard to imagine an office processing paperwork or reservations without resorting to a computer. In contrast,

terms as 'e-Gov' suggest that the sector itself is not yet fully computerized and networked. In the past, when networks were neither fully implemented nor reliable, customer firmly believed that they needed to visit a bank or a public office and talk to the staff there to complete a transaction, quite naturally of course, as it was risky to solely rely on telecommunications and networks. Even today, the survival of traditional business practices speaks to the tenacity of this psychological tendency. However, as we know, today ATMs are commonly used for personal banking and reservations routinely made via the Internet. Only certain aspects of these businesses require staff to take care of clients from behind a counter.

MAJOR REVERSAL OF EDUCATIONAL PHILOSOPHY

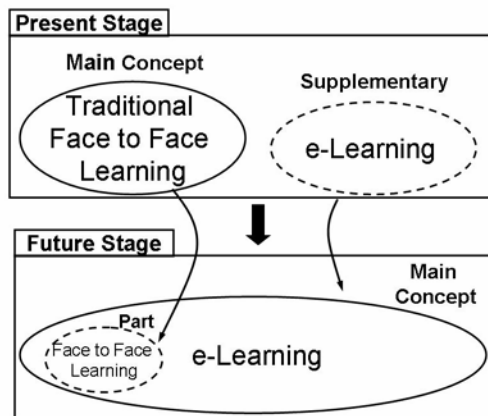


Figure2: Change of Main Concept in Learning

It is meaningful to consider e-Learning in this context. As computerization, networking, and the application of information technology have not yet been integrated into the education sector, many people concerned still believe that mainstream education must be school education based on traditional face-to-face lessons as a matter of course. In regard to e-Learning, at most it is seen as one of many tools that support classroom lessons. Some educators are still living in the pre-information age, where banking transactions are made at the counter, so to speak.

In the past, lack of advanced communication networks meant, aside from distance education by post, traditional face-to-face lessons were the only learning method available. For this reason, the traditional face-to-face lesson was considered the bedrock of education, a belief which has now been rocked by the advent of e-Learning. To take another example from the banking industry, customers who take their bankbooks and seals to the counter at the bank to deposit, withdraw or transfer money are today the exception and not the rule. Such transactions can now be processed using a money card at any ATM. In any case, the counter transactions of a traditional customer are merely fed into the bank's same information network.

This banking analogy clarifies the relationship between traditional face-to-face lessons and e-Learning in education. The new paradigm is that e-Learning represents the true nature of education and traditional face-to-face lessons in universities and schools are, so to speak, exceptional practices. In the age of networking, sole reliance on traditional face-to-face lessons is tantamount to asking customers to only make transactions at the counter, which is unacceptable to customers who use networks. Put simply, the spread of e-Learning is causing a major, if somewhat belated, shift in educational philosophy. However, adopting this new paradigm will take considerable time as there is a great deal of inertia in educational communities that have always practiced traditional face-to-face education.

STRUCTURE OF E-LEARNING

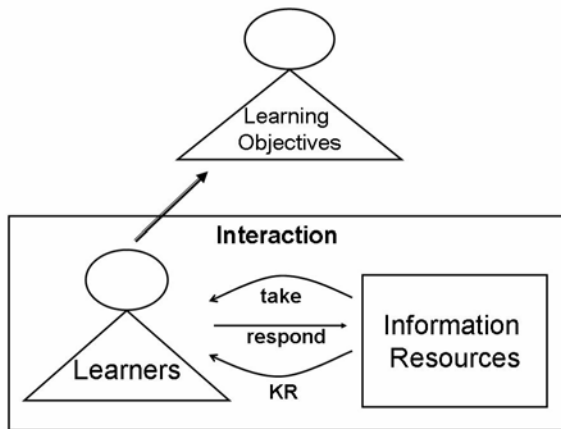


Figure3: Mechanism of Education

Education consists of interaction between learners and information resources. Information resources for learning include not only teachers, students, peers, experts, civil servants, politicians, and other members of society, but also resources such as educational materials, textbooks, other books, videos, CD-ROMs, DVD-ROMs, educational Web sites, as well as the social and natural worlds. Anything can be a resource for learning. Additionally, anybody can be a learner. Learning is not restricted to children or students; Teachers, experts, civil servants, politicians, indeed, all members of society can be learners. The relationship between learners and information resources should allow for synchronous and asynchronous learning in terms of time; a multiplicity of environments in terms of place; and a variety of methods, encompassing lectures, drills, experiments, observation, individual practices, small-group activities, and distributed and collaborative activities. Education is the state of affairs where learning objectives are achieved through learning, pursued in a variety of conditions yet always aimed at these objectives, and realized in the interaction between learners and learning information resources. Therefore the collective learning which takes place between teachers and students in traditional face-to-face education at universities and schools can be considered a special or exceptional situation. Previously, due to the late introduction of information technology into education, learning methods other than traditional face-to-face lessons were generally unavailable, causing educational communities to believe the traditional lesson to be the only possible learning method. On the other hand, it may be very difficult to imagine that everybody will be able to learn anyplace anytime through any means in a fully networked society. Of course, it goes without saying that traditional face-to-face education is still important at universities or other schools. The traditional method can be regarded as a kind of pure situation, and as such it offers certain advantages, including a number of principles and basic understandings it delivers which can be applied effectively to education in general.

The strengths and limitations of education and the traditional face-to-face method are clarified in this context.

Information communication technologies such as OHPs, videos, projectors, and computers are the aspects of e-Learning in traditional face-to-face education. For distance education, e-Learning takes the form of content connected to a network. Networks make available knowledge from all over the world, enabling the learner to take the initiative in selecting and studying necessary content from anywhere at anytime.

Yet while traditional face-to-face education cannot fully offer such advantages, distance education does not sufficiently enable visual communication such as facial expression, gesture, enthusiasm, and emotional contacts between teacher and student, which constitute extremely enjoyable aspects of traditional face-to-face education. In order to effectively promote education, the need to incorporate these factors as important components of education should not be underestimated. Distance education

needs to show improvement in this area, for example by including bringing in mentors or actively using images and arranging off-line meetings. Teachers also need to be prepared in face-to-face lessons and should pre-download content when using the Internet in the classroom. This kind of care will effectively improve education aimed at imparting knowledge, yet education which aims to discover or create new knowledge further needs to provide occasions in which learners can gain experience and solve problems in a stimulating environment, all of which are necessary for effective intellectual learning.

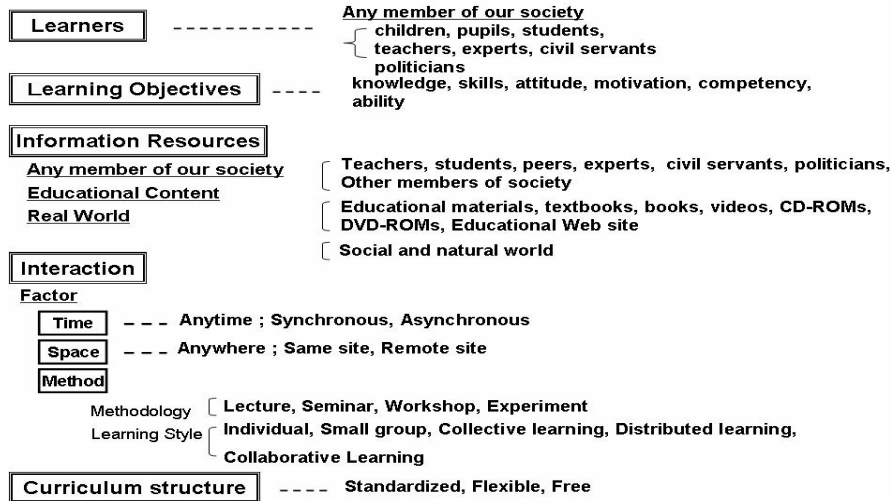


Figure4: Details of Components

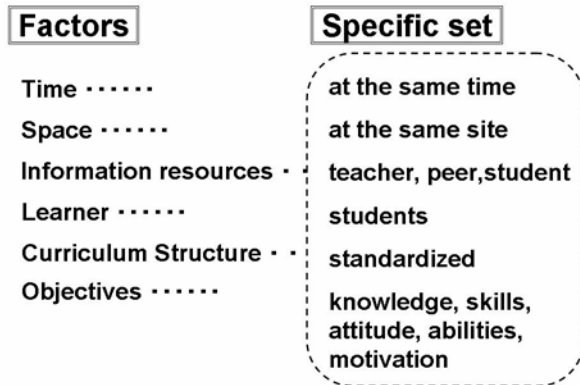


Figure5: Characteristics of Traditional F to F Education

INFLUENCE OF E-LEARNING ON UNIVERSITY EDUCATION

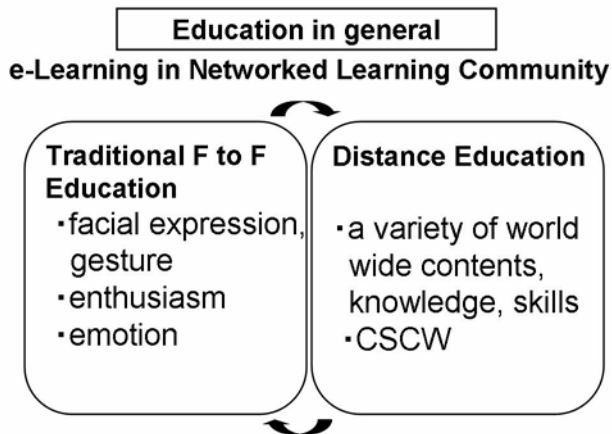


Figure6: Mutual Influences between Traditional F to F Education and Distance Education

The spread of e-Learning will significantly influence university education. In an aging society with a diminishing youth demographic, thirty percent of universities and forty percent of junior colleges cannot meet their quotas. In addition to this severe situation, the introduction of e-Learning makes it more difficult for even prestigious schools to secure students both in Japan and abroad. A number of renowned foreign universities now confer master degrees on students who study solely via e-Learning. This matter will become more pressing as Japanese students improve their English and/or foreign universities offer courses in Japanese. Universities are engaged in a variety of planning at the reorganization of national universities into independent corporations. Nevertheless, major threats are on the horizon as various corporations, organizations, and education businesses are expected to offer educational courses which match those provided in universities, though some of this planning has already been implemented. These new competitors will award diplomas and qualifications that may be highly valued by society, thus conferring on them universality and legitimacy.

DOSMETIC DISTANCE TEACHING SYSTEMS

One of the most important initiatives for the informatization of education in higher education is the Space Collaboration System (SCS) with its hub at the National Institute of Multimedia Education (NIME). SCS is a satellite communications-based educational exchange system. There are now 150 VSAT stations in 120 universities and other institutions for exchanging lectures, seminars and academic meetings. Every VSAT station can host lectures, seminars, conferences and other events. Each VSAT station is equipped with two large display screens: one showing the incoming image from the communicating station: the other, the image from the home site or third station in contact. The SCS is used for 3,000 hours per year.

Using this system an interesting activity such as ISS-SCS space lecture was conducted in November 2001.

SCS was connected to ISS (International Space Station) which was rotating the globe in 90 minutes for one circle. Japanese students asked questions to three astronauts in ISS. One American astronaut and two Russian astronauts answered the questions. Global space class was successfully implemented.

Another national system, the MINCS-UH (Medical Information Network) links 30 university hospitals with the world's first digital high-definition bi-directional TV communication system. This system is utilized for clinical conference, lecture, seminar, tutorial, staff development and so on. The utilization hours are not so much as nearly 100 hours a year, because of expensive communication costs.

Hokkaido Information University also uses a communications satellite to deliver its Promoting Information Network for Education System (PINE-NET) distance education courses to 16 branch schools around the country, and simultaneously uses a terrestrial system to get feedback. The el-Net system, with terrestrial stations in more than 2,000 educational institutes (including VSAT stations and

receiving stations) provides continuing professional development programs for teachers and others concerned with education, and for the Open College. Now fifty one universities provide the general public with access to 173 university-level courses. Besides them many universities such as Waseda University, Shinshu University, University of Tokyo, Tohoku University and so on, offer web based courses and lectures nation wide.

INTERNATIONAL DISTANCE EDUCATION

Recent years have seen a rapid increase in the number of virtual universities and universities offering courses and programs online from around the globe and it is now possible for Japanese nationals to obtain certification from overseas universities without leaving the country or their places of work. In Japan too, some universities have started to provide Internet and video-conference virtual programs and a growing number of Japanese universities are linked to overseas universities in these initiatives.

Some progressive universities are well using communication satellite, videoconferencing system and internet for education, but these are still insufficient. In the most of the higher education institutions, VCR, data base of printed materials, e-mail to enhance administrative efficiency, e-mail for communication and evaluation, presentation via computer are mostly utilized. However, recently the shift of use from communication satellite and terrestrial media to the internet is recognized. Common difficulties are heavy burden on specific individuals and shortage of budget, staffs and facilities.

MEASURES AGAINST CHANGE

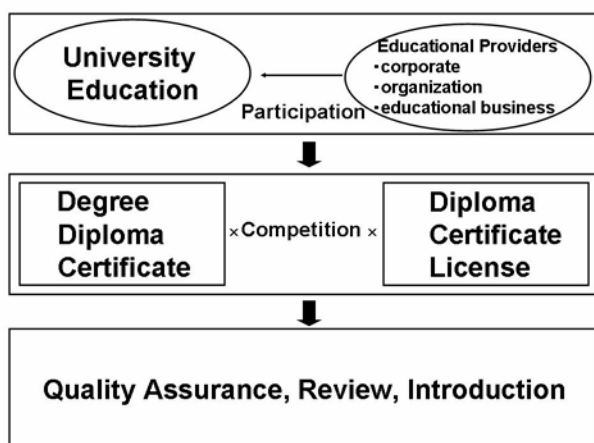


Figure7: Participation of Different Types of Educational Providers

Domestic universities will be required to take countermeasures against a changing educational environment in which renowned foreign universities, prestigious educational businesses, and other companies offer educational courses. Specifically, high-grade education with a competitive edge should be provided. Individual universities should integrate their unique programs in consortium in an effort to complement and collaborate with one another. Each university's unique courses, educational materials and instructional resources should be shared interactively. Additionally, distance e-Learning should be implemented. As a new slate of information providers enters the field of the higher education, one consideration is that society and students may be adversely affected by the emergence of dubious diplomas from so-called degree and diploma mills. Accordingly, it will be essential for universities to reassess and guarantee the quality of a range of educational elements including faculty, students, educational materials, instructional resources, educational methods, appraisal of academic achievement, the educational environment, and organizational operation. It is also important that domestic universities confer degrees that are highly regarded internationally. Universities must ensure that students sent to universities abroad have academic capabilities that meet the required standards. Universities must also prove that they are able to offer educational guidance to foreign students. To these ends, it is significant that we will establish appropriate systems to certify and assess the quality

of universities, adjust standards according to the results of such an assessment, and make these results available to the public.

However, currently there is a significant lack of experts at universities capable of making such an assessment. Universities of course have a great number of experts in every academic field who are waiting for a new breed of competent, socially aware, and solidly international managers of educational instruction, finances, human resources, and publicity. By promoting the activities of administrative staff and enhancing the management capabilities of academic experts, we must foster human resources able to administer the assessment and certification of quality at universities as well as take charge of pre-reviewing assessment objectives. At the present time, we have a plenty of talented persons with a passion and expert with deep knowledge of their specialty—so-called 'academic boffins', 'publicity boffins' or 'social policy boffins'—yet what is desperately needed are experts with outstanding talents that surpass our most valuable boffins, boffins truly deserving the title of 'meta-boffin' or indeed 'meta-meta-boffin'. We must carefully nurture these valuable people and formulate a system which promotes them to positions such as corporate director generals, heads of special organization, university presidents, research group leaders, or deans. With these efforts, we can look forward to the further evolution of universities leveraging the need for reformation.

The one of the most important means to enhance such university leaders is e-learning, which can provide a variety of knowledge, human network, opportunities for simulation in various fields through network learning communities.

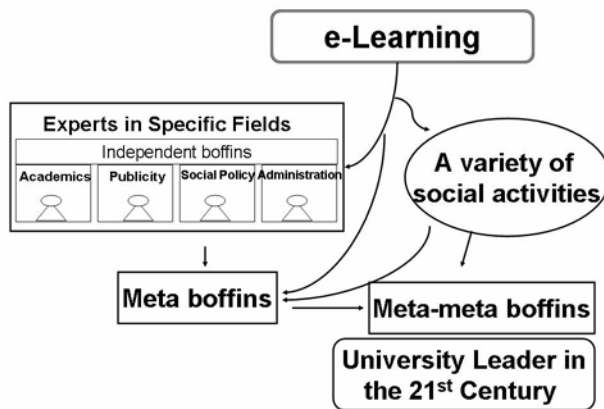


Figure8: Competency of Future University Leaders

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Sakurai, Yoshihide, Hokkaido University, Japan. Contribution to Cultural Bases of Community: How Do University Academics Collaborate with Professionals and Citizens?

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In 2004 every state university in Japan with over a century of history became an independent administrative corporation, although most state universities were opposed to facile budget and administrative reform. As a result, those universities began industry-university joint research, law and management schools for adult students. To date, Japanese firms have run their research own institutes and on-the-job training systems. However, the industrial-government complex recently used the potential of laboratories and human resources in universities to encourage collaboration. In contrast, the faculties of human and social sciences, unrelated to industrial and business needs, were behind these new trends, and had to consider how they could serve many uses.

This paper illustrates recent activities of Hokkaido University and their academics in collaborating with communities and considers their potential to facilitate a Life-Long Learning society.

Hokkaido University has the Center for Research and Development in Higher Education, and its Life-Long Learning research division has two main projects: fostering community colleges and developing internship programs. These are indispensable social functions of contemporary universities. However, the Center's role has not been sufficiently fulfilled due to a shortage of clerical coordinators and middle men mediating the demand of society and the supply of the university.

A temporary settlement could lie within academics' initiatives to set up networks and forums among professionals and citizens who are concerned about meaningful lives and community development. The case of one such forum will be illustrated in detail in this paper. The religious information forum of Hokkaido was set up by scholars of religion and religious persons representing Buddhism, Shintoism, and Christianity. They contributed to solving contemporary religious problems and their efforts showed how humanities and social sciences may contribute to society in contemporary Japan.

1 Changes due to the Incorporation of Universities as Independent Administrative Institutions

1-1 Incorporation of National Universities

Since the 1990s, Japan, while struggling with prolonged economic stagnation, has switched from the welfare-state model to promoting the idea of small government and decentralization based on neoliberal economics. (Geoff 2002) In the second half of the 1990s, the idea of privatizing the national postal service, savings and insurance as well as national universities suddenly emerged as part of administrative and financial reform. It was not uniformly applied to all ministries and agencies across the nation. In order to pass the 1998 bill that would reduce the number of national civil servants by 25%, the new policy was applied to the Ministry of Posts and Telecommunications (MPT) and the Ministry of Education, Culture, Sports, Science and Technology (MEXT). It was designed to reduce the outstanding public bond debt of 600 trillion yen, which included that of local municipalities. It was a reform linked to political motives of the business community. While putting on hold the problem of the costs of public-works projects, which had ballooned to two to three times the total cost of social security payments, the reform was designed to release such community-oriented infrastructure as the postal service, postal savings and postal life insurance to delivery companies, banks, and insurers. By comparison, the idea of incorporating state-run universities, vocational high schools, and research centers surfaced not due to pressure by private universities, but was merely an accounting strategy designed to reduce more than 125,000 faculty members.

Initially, individual national universities objected to this bill proposing to incorporate them into independent administrative institutions by using the Association of National Universities as contacts. But once those national universities realized that they could not change the momentum towards the approval of the bill, they switched to a conditional strike regarding the content of the National University Corporation Law. After just a two-to-three year debate, the bill was approved on July 8, 2003. (Kagaku 2003) On April 1 the next year, 99 national universities in Japan, including junior colleges, were transformed into 89 national university corporations (10 were merged). Consequently, the author became an employee contracted with a university corporation and started paying for unemployment insurance.

Changes resulting from the incorporation of national universities can be summed up as follows:

- 1) The regulations were widely relaxed so that national university corporations could independently determine their budget and manage their organizations.
- 2) The “Board of Directors” and “Management Council” were set up within the university; private-sector management methods were adopted.
- 3) Universities normally receive operating grants for their budget from MEXT. A third-party evaluation body assesses the implemented content of the 6-year midterm goals and plans, which is reflected in the budget grants in the future.
- 4) The staff of national university corporations were stripped of national civil-servant status. The new system of position and salary is based on the ability and accomplishments of that staff member.
- 5) Regarding operating grants, educational research expenses and office expenses were reduced by 1% and 3% respectively in the fiscal year 2005 from the previous year. It has been decided that part of the grants would be pooled to subsidize outstanding research. It is not certain what those reduction rates will be. But, national university corporations are expected to operate independently through financing from outside sources in addition to their operating grants, for example via affiliations with corporations and municipalities.

The founding of national university corporations has had repercussions with public colleges in individual municipalities throughout the nation. Some public colleges, which had aspired to become four-year universities, have had no choice but to convert themselves to community colleges. A typical example is the case of Tokyo Metropolitan University, which was founded by merging four colleges in Tokyo. The university, specializing in urban planning and environmental studies, is due to open in the 2005 academic year. This college reform is to be implemented by Tokyo Governor Ishihara and the Tokyo metropolitan government in a top-down fashion. Thus, a large number of teachers have objected to the concept of this new university and the way the reform was carried out. Some teachers decided to retire before their retirement age. It is said that the number of teachers who have decided (or are planning) to move to other colleges from the current one will reach a quarter of the total number of instructors, 600. There are also many other colleges whose faculty members are still opposed to the reform.

According to the July 23, 2004 report by the advisory panel of MEXT, the Central Education Council, due to the declining birthrate, the number of college applicants is estimated to decrease to approximately 699,000 by 2007, which is nearly the same as the maximum enrollment of all college students (the total college applicants in 2004: 704,000). As long as the applicant is not very choosy, he or she can enter college somewhere. Yet, every applicant has a preference concerning college, department and region. It is thus natural that prospective students flock to certain colleges and universities. Because of the number of students who decide to spend another year preparing for college entrance exams, the maximum enrolment cannot be met, greatly affecting the foundation of management. This was predicted to happen over 10 years ago; whether private colleges in regional areas or new colleges in cities, colleges have had difficulty attracting students. Inevitably, there will be a number of colleges going bankrupt in the future.

Over 760 Japanese colleges in total, incorporated national universities, and public and private colleges, have already come upon hard times as they have had to compete for students. (Ushiogi2002) That does not mean that all colleges must prepare for competition. For example, prestigious urban-type private

universities such as Waseda University have received the long-term preferred liability rating of AA+ from credit-rating firms. They have prepared with perfected systems to attract investment from corporations; top-rated universities such as the University of Tokyo and Kyoto University are inundated with applications for joint research from corporations. Those universities are followed by prestigious private universities located in such major cities as Tokyo, Osaka and Nagoya, which take the lead in maintaining the number of students and in developing employment opportunities for them using a method of corporate management. And as intermediary groups, regional national university corporations have finally undertaken college management. While seeking affiliations with local business communities and municipalities, they have begun to be active as community-based universities. Hokkaido University, which the author will discuss in this paper, is one such institution.

1-2 New System of Incorporated National Universities

Graduate and undergraduate school faculties of national university corporations consist of majors and departments. The minimum unit is a chair. The philosophy behind this was Germany's Humboldt-type research university. Thus, to improve or eliminate a chair, the college needed approval from MEXT. Only for serious reasons or through terribly complicated procedures, could a chair be newly set up or added, but seldom was one eliminated. It used to be that for college instructors, education and research were fully guaranteed by the government. The budget for education and research automatically accumulated in accordance with the numbers of instructors, and graduate and undergraduate students. Even with a chair for one or two students and when graduate and undergraduate students advanced in alternate years, instructors did not have to be concerned; all that was required of them was simply to concentrate on their research work and they were guaranteed to be crowned with a chair. Regardless of the trend or obsolescence of the academic subject, public reputation, or the preference of students, hermit-like instructors who toiled alone in research laboratories have been valued as "university people."

Those universities, with a majority of instructors like the above, were operated by senior professors, who had been elected by mutual vote, and staff members. They would receive divided budgets from MEXT following the previous fiscal year, which was allocated to individual chairs. Therefore, as long as they operated in line with school rules and office regulations, there was no problem. Most teachers and administrative staff members at postwar national universities could stay at their post until their retirement age except for the 1960-70 period of the student movement and the period of college administrative reform after 1992. The typical parting-speech for a retiree was concluded with words of appreciation for his or her lifelong work at the university.

As of April of 2004, however, everything changed for faculty members at national universities. Though their mindset remains almost the same as that of semi-civil servants, they clearly work differently now. Regarding the administrative office system, due to the national policy of reducing the number of employees, currently, with one half of the staff compared to peak years, they now handle a two to three times greater workload including the revision of regulations and budget execution as well as document preparation for third-party evaluation by working overtime. To be more accurate, most of the documentation and computer input has become the work of teachers. Since the nature of work discretion is left up to teachers, no wage is paid for overtime work. The Hiroshima University Teachers' and Staff Union once requested the Labour Standards Inspection Office to conduct an on-site inspection of the university corporation. It was to prevent a rapid deterioration of the work environment, specifically the unpaid overtime work in violation of the labor-management agreement. This deterioration of working conditions is very profound.

Budget allocation and budget execution have become performance-based and plan-based. The education and research budget as operating expenses has been cut in half at most national university corporations. Even in the same graduate school, there have been differences between chair depending on the actual enrolment of graduate and undergraduate students and the emphasized allocation in certain research areas. In addition, research expenses are expected to be basically provided by aid from the Japan Society for the Promotion of Science, ministries and agencies, aid from private-sector foundations, and undergraduate funds for corporate-sponsored chair and commissioned research. Just

as with major natural science scholars, project-type research has been exalted among humanities scholars for its ease in obtaining research funding. As a result, there is more than 10-times greater difference between a top research group who can spend abundant funds, which was selected for COE (“Center Of Excellence”) by MEXT, and a chair with only an operating expense budget.

2 Existing Conditions of the Hokkaido University Graduate School of Letters and Problems of Community-Based Universities

2-1 Hokkaido University Graduate School of Letters Today

Hokkaido University was founded 127 years ago. It consists of 12 graduate and undergraduate school faculties. Currently there are over 17,000 students, all commuting students. Hokkaido University was one of the former Imperial Universities, the oldest universities in Japan. Its vast campus is located in the center of Sapporo, a city with a population of 1.8-million, and the college environment is ideal for education and research.

However, now that Hokkaido University is a national university corporation, it will be difficult to secure excellent undergraduate and graduate students and maintain its research standards simply depending upon the prestige of being a former imperial university. Hokkaido is a vast island in northern Japan, a prefecture with an area equal to several other prefectures combined. Yet, its population is a mere 5.7 million, about the same as one of the prefectures around Tokyo. Hokkaido has many primary-industry-oriented rural areas, and just the densely populated Sapporo metropolitan area. Thus, Hokkaido University cannot remain as a community-based university just by recruiting students on this demographic scale. For this reason, the university has been active for several years in advertising by hosting open campuses for prospective students from other prefectures.

It is true that national universities in Japan still enjoy the advantage of being pioneer institutions. In natural science, unlike private universities that have the limited specialized fields of electronic engineering and bio technology, national universities are equipped with all-round graduate schools of applied research fields such as agriculture, engineering, information science, pharmaceutical science, medical science, veterinary medicine, and fisheries, which are centered on basic science at the graduate school of science. Compared with regional public universities that were founded after the war, national universities are overwhelmingly more blessed in terms of facilities and research budget. They also maintain strong connections with manufacturing companies and research centers throughout the nation to send their graduates. Thus, they should have little difficulty securing undergraduate and graduate students. (Burton 1995).

The faculties of law, economics, and pedagogy, which established a law school, business school, and school of educational administration respectively, have attracted a surplus of applicants. However, the faculty of letters, lacking a professional school, faced serious shortages of applicants. At the Graduate School of Letters, there are per grade 118 master's degree students, 59 Ph. D. candidate students, and 185 undergraduate students. The roughly 130 professors, assistant professors and assistants are considered to be over the recommended number and could be targeted for downsizing. The author, as a member of the Committee on Future Vision, is very concerned about the recent circumstances of my faculty.

The immediate problem of this school comes down to the fact that it is no longer able to continue attracting high caliber graduate school students. Since students of the Graduate School of Letters study the humanities, which have no connection to practical science, those who have completed graduate or post-graduate courses have had difficulty in finding employment. Potential jobs for them are often as high school teachers, museum curators, and college instructors. However, it has become usual that after earning a masters or doctoral degree, they had to work as a part-time teacher for several years at their respective universities before finding a teaching job at a college. Japanese corporations, with their focus on practical sciences, rarely recruit students with a doctoral degree in the humanities. For this reason, when the graduate school used to function as a researcher-training body, only about one-tenth of undergraduate students went to graduate school. But, since then, Hokkaido University has become more graduate-school oriented, increasing the maximum enrollment for graduate students.

Now, over 60% of undergraduate students study in a masters program and over 30% in a doctoral program. And if they continue to have trouble finding work that corresponds to their degree for a few more years, the incentive for graduate school applicants will decline. Furthermore, the number of students will not meet the maximum enrollment, and eventually, the Graduate School of Letters will be forced to scale down.

2-2 Towards the Creation of a Social Capital Called the “Lifelong-Learning Society”

It is impossible for a university to generate work or directly create markets for its researchers. Worse, the youth population has been steadily declining due to the low birthrate. What we can think of, therefore, is recurrent education or lifelong learning. (Kobayashi 2000) In recent years, “lifelong learning” has begun to be established in Japan, so I will use this term in the following discussion. There are two types of lifelong learning. One is when we aspire to improve individual professional skills at a specialized graduate school. The other one is when, in response to the lifelong learning trend in society, people in middle age or older return to college to study subjects of personal interest. The type of lifelong learning the humanities can contribute to is the latter. The life expectancy for Japanese men and women is 79 and 85 respectively; the highest in the world. Thus, there must be great demand among middle-aged and older adults who want, for instance, to study history again or to learn a new subject from the beginning. The question is how to respond to such demand.

The Graduate School of Letters offers a wide range of opportunities for such people, and annually hosts open classes for the general public. The problem is that when we try to adapt the content of the courses to the needs of citizens in general, they tend to become similar to those in lifelong learning courses of local municipalities. Typically, they are ceramics, dancing, and how to read novels, a far cry from the content of university lectures or research. Artists and business people rather than university instructors are more suited to teaching those courses.

What is required of university instructors is not to lecture citizens in the way they would with undergraduate and graduate students. Rather, it is to teach them how to think in general. First, the lecturer should discuss specific, familiar issues and gradually progress toward more abstract and historical issues. Currently, this inventive approach is still lacking and its importance is not sufficiently recognized by the instructors at the Graduate School of Letters.

That humanities specialists cannot find employment means that the value of the humanities is not fully appreciated outside the institutionalized realm of the university. The humanities are relegated to a corner in the university because it has made the least economic contribution to the university’s educational reform. This condition alone confirms the low value placed on culture not only in society in general but also in university society. To change this condition, we need some kind of mechanism to connect the humanities and the general public. In addition, various measures must be taken on a trial-and-error basis. At this time, as one of the trials, I would like to introduce the Forum for Religious Information.

3 Activities of the Hokkaido Forum of Religious Information

3-1 Collaborative Efforts to Discuss Religious Problems by Scholars of Religion, Personnel of Religious Institutions, and the General Public

On February 27, 2004 the Tokyo District Court handed down a death sentence to Shoko Asahara, the guru of the Aum Shinrikyo cult group. This religious group was responsible for the 1995 sarin-gas attack on the Tokyo subway system, in which 12 people were killed and over 6,000 injured. Since then, Aum Shinrikyo has changed its name to “Aleph.” Currently, the cult group still continues to exist, with more than 500 live-in Aum members and over 700 lay followers.

The Aum incident acutely revealed the “cult problem” in Japanese society. However, we cannot fully protect ordinary citizens, particularly youth, from falling victim to such cult religious groups simply through sensational media attention and by the police and judicial system, which brings particular religious groups to justice for their unlawful acts such as murder, confinement, intimidation, fraud, and violation of the Pharmaceutical Law (Sakurai2004b).

What, then, can we do? If the general public has easy access to various kinds of information on the problem of religious sects including “cult” groups, they may be able to make appropriate decisions of their own when under pressured to join a religious sect or purchase “spiritual” goods, or are intimidated by other forms of illegal misconduct.(Sakurai2004a).

Unfortunately, the Shinto, Buddhist, and new religious community are collectively still hesitant about responding to cult-related problems, and only a handful of generous religious leaders offer consultation on a personal basis.

Thus, Hokkai Gakuen University professor Hiroshi Tsuchiya, a New Testament scholar who has long been involved in YMCA activities, and the author, who studied in college under Tsuchiya’s guidance, decided to set up an organization called the Hokkaido Forum of Religious Information. We launched it in late 2003 in response to the urging of a wide range of people --- Shinto and Buddhist groups, Christian priests, and religious educators of educational institutions. This forum meets bi-annually to host public discussions on a variety of religion-related topics.

Conventionally, this type of open seminar has been held mainly in the Tokyo metropolitan area under the auspices of academic societies, newspapers and magazines. Although it was open to the general public, the public was regarded as an audience. Important agenda items such as “what to discuss and what to propose” were often decided by scholars, and on-site and clinical experts. Furthermore, those experts did not mingle and were segregated by their profession or academic sect with little contact with people in different fields. Hokkaido was no exception.

To overcome the sectionalism that is bound by the interests of one’s group and to discuss public issues from the standpoint of citizens, the Hokkaido Forum of Religious Information invited participants from various fields to examine the issues from multiple perspectives.

Religion is regarded as a matter of personal belief in Japan and thus, from the standpoint of the separation of church and state, the judicial and administrative systems do not intervene in religious issues. Open debate on religion-related problems used to be nearly taboo both in the media and on college campuses. In college extension courses or citizen’s “cultural center” events, the subject of religion has been strictly avoided. However, as we now face scores of problems in religious and religion-related areas in addition to the cult issue, those problems need to be addressed as public issues. And so, as the first subject for the forum, we decided to take up the topic of “funerals.”

3-2 Overview and Accomplishments of the “Funeral” Symposium

Traditionally, most Japanese have had a lesser interest in the “funeral” than in “death.” Those who arranged funerals were the bereaved family, not the deceased himself, and all they needed do was follow the tradition of their family and region. In most cases in Japan, the Buddhist temple where a funeral was to be held was pre-ordained depending on the family religion, and the neighborhood community presided over the funeral arrangements.. Only in the case of Japanese Christians, who comprise approximately 1% of the Japanese population, were personal belief and philosophy involved in one’s funeral. (Himonya 2003).

As urbanization has expanded in Japan, the funeral tradition has also changed to the extent that we normally use the total services of a funeral company, including the arrangement of the reading of the sutras by Buddhist monks. In addition, in ancestral ceremonies in Japan, the departed should be given a posthumous Buddhist name as a disciple of Buddha. This name, however, varies in class depending on the fee. A common price is \$2,000 to \$3,000, while the highest class can cost up to \$40,000. Even now, since personal vanity varies according to family prestige, the national average for funeral expenses is \$20,926, which mainly consists of the fees for the altar, the reception of the mourners, the posthumous name of the deceased, the number of monks in attendance, and miscellaneous fees for the funeral company (Japan Consumers' Association2000).

The number of middle-aged or older participants in the Hokkaido Forum of Religious Information has already reached 70, reflecting their high interest level. Most of the elderly sought specific advice about their own funeral. They wanted to know how much money they should leave to their children to cover the costs, or how much money they should allocate if they had no children, or to hold a funeral in their own way, what kind of procedure (a will) would be necessary. Other participants included a Shingon sect monk, funeral firm presidents, and a seller of ecological urns.

Hokkaido Forum of Religious Information: 1st Meeting (March 20, 2004): Funerals and Religion --- Where Do the Expenses Go?

- 1) Hiroshi Tsuchiya (Christian Theology, Hokkai Gakuen University) “Our Involvement in Funerals In the Context of Society and Times”
- 2) Kurumi Abe (Professor, Fuji Women’s University; Catholic Teine Church Congregation Sub-Representative) “Funerals at a Catholic Church: Disclosure of Funeral Expenses to the Public”
- 3) Akiko Nagasaki (Director, Incorporated Non-Profit Organization Citizens’ Group To Discuss Funerals) “Modern Funerals: Activities of Citizens’ Group To Discuss Funerals”

Reported in the lecture was a case of a Catholic church, in which the dealer of funeral and ceremonial events was selected by bidding and the total estimate of funeral was publicly disclosed. An NPO’s ideal approach for reexamining modern funerals from the viewpoint of the citizens was also reported. In modern times, we have a strong sense of making choices of our own, and death and funerals are no exceptions. Some childless couples wish to have a group tombstone combined with a permanent memorial service for the dead. Some people want to have their ashes scattered in the ocean or on a mountain rather than having them buried under a tombstone. More people prefer a private funeral to an extravagant, large-scale funeral.

Of those topics, heatedly discussed at the forum were the realities that the funeral companies receive half of the fee for the posthumous Buddhist name as a kickback from their affiliated temples, and that regardless of the intention of the deceased and the bereaved, the funeral company takes full control of the event, causing dissatisfaction and anxiety for the citizens. Also expressed were concerns about illegal business practices that take advantage of the lack of knowledge and information concerning tombstones and ceremonies and possible fraud that exploits the concept of “curse” preached by certain religious groups. Since there is no obligation to disclose the fee for posthumous naming and the amount of offerings for the service or contributions to Buddhist monks or Christian priests, market prices tend to be unnecessarily high. Thus, people in general wish to see that aspect become more transparent.

Universities have offered opportunities to learn Sanskrit, Pali original texts and religious theories. But, in the past, they could not meet the literally “life-and-death-related” intellectual needs of the citizens. Now, by providing this forum for citizens, we can elicit easier explanations and fact-finding reports on religious issues from the people concerned. We believe that once we offer those sources as data, we will be providing a place for lifelong learning.

3-3 Overview of the “Mental Care” Symposium

Since the 1990s, it has become more and more common for the Japanese media to explain social events and social issues in terms of the concepts of mental health and psychotherapy. New terms such as disaster victims, posttraumatic stress disorder (PTSD) victims, and adult children of dysfunctional families (ACOD), which described how increasingly children and young people have difficulty leading their lives in society, have been used with increasing frequency. There has been a growing need for “experts on mental problems.”(Bellah1985, Kashimura 2003)

When an elementary or middle school student commits a violent crime, a psychiatric evaluation is routinely conducted. But, oftentimes no organic mental disorder is detected and adults are horrified at the depth of the darkness in the mind of the child. The estimated number of young Japanese people who are considered “shut-ins” or NEET (no education and employment training ; they typically do not find employment after graduation, live with their parents after quitting work, or stay holed up in their

rooms with very little contact with the outside world) has climbed to 200,000 or 300,000. This is one of the serious youth problems facing Japan.(Saito 2003)

Hokkaido Forum of Religious Information: 2nd Meeting (September 26, 2004) Youth and Therapy: the Meaning of Emotional Healing and Nurturing

- 1) Yoshihide Sakurai (Professor, Sociology, Hokkaido University Graduate School of Letters) “The Issue of Cults on Campus: Recruiting Methods of Certain Religious Groups and My Involvement in Student Counseling”
- 2) Keiko Ichikawa (Adjunct Instructor, Mental Health Counselor, Hokkaido University Health Administration Center) “In Consideration of the Mental Growth of Children”
- 3) Yoshiyasu Inoue (Professor, Clinical Sociology, Sapporo Gakuin University) “Questioning the Psychologized Society --- The Chain Reaction of Therapy-Oriented Culture”

While the media allures children and youth by focusing on stories of success and self-realization, a large number of people will fail to measure up in the fierce education-conscious culture and “rat-race” corporate culture. It is not uncommon that some young people who feel underappreciated in the family, in the workplace or among their peers, resort to therapists, the Internet or religious cults. Those involved realize that unless we change those background factors, mere emotional support or care as a follow-up does not solve the core problem.

Also reported in the lectures were the issue of on-campus recruiting, the efficacy of student counseling, and the existing condition that most college students lead a day-to-day life with no sense of purpose. It was also reported that there are many cases involving the current therapy industry including self-development seminars, in which therapist inflict psychological damage by infringing upon the mind of the client.

In the discussion, the issue of modern minds excessively seeking “healing” was highlighted from various perspectives. Some pointed out that the problem of therapy is that the therapy offered on medical and clinical sites in response to the request of people may cause an anaclitic psyche. While the issue of mental care has become more specialized and “medicalized,” our power to “heal and nurture” people in daily life and interpersonal relationships has declined. Now, if that is the case, what kind of measures, specifically, are possible in education, in the family and in the region? We need to develop answers to this question in the future and all the participants must have keenly realized that.

In this meeting, no topics directly related to religion were presented. Traditionally, religion has provided citizens with a code of ethics and spiritual support, but that has begun to crumble. Consequently, therapy and counseling have been established as a substitute system for religion. Although the number of participants was not quite as large as in the previous meeting, it was very beneficial in that the general public, experts in medicine and education, and leaders and researchers of religion were able to share their awareness of the problems regarding specific problems of children and youth in Japan.

The Hokkaido University Faculty of Letters is home to a group of international researchers in cognitive science and brain science. Yet, since clinical psychology and counseling are not regarded as a science in the strictest sense, we have relied upon an adjunct counselor in the faculty for student counseling. That this counselor made it possible to have a discourse with the general public may symbolize the distance between academia and civil society.

4. Conclusion

In conventional discussions on lifelong learning and social welfare in preparation for the rapid aging of the population, the discussion usually boils down to how to provide the elderly or other ordinary citizens with “purpose in life” As a result, academic courses in hobbies, entertainment, language, history and literature have been offered as extension courses for citizens. Yet, to dispatch instructors to lifelong learning classes should not be the main role of universities. Rather, they should play the role of a catalyst in applied sciences to generate new industries in the field of natural science. In the

humanities and social sciences, we need to reeducate students with specialized skills such as the improvement of professional qualifications and the ability to help resolve various issues in the real world.

The direction of the Hokkaido Forum of Religious Information towards sharing information on religious issues and problem-solving by open discussion also shows one direction for the humanities. However, in order for this forum to function effectively, it must meet several conditions.

First, we need personnel who can act as middlemen or coordinators between citizens and university experts. The forum cannot function unless there are people who understand the needs of citizens and then elicit special skills from the experts. At this point, this type of activity is conducted in the form of personal services by university instructors who work off-campus for this civic activity and they are not limited to Hokkaido Forum of Religious Information members. Still, restrictions on their time and labour are considerable.

Second, at the level of masters programs in the humanities and social sciences, we should consider the training of coordinators. If such personnel can work effectively as a university office clerk in the division in charge of lifelong learning, the burden of the aforementioned university instructors will be reduced. The forum has not received any support from the university. But, if it can obtain budgetary and physical support as a lifelong-learning college program, the forum will function much better.

Third, universities should encourage people to acknowledge the value of the coordinators in society. Newly established in the field of applied natural sciences is the division to preserve and promote intellectual property that connects inventions, patents, commercialization, and entrepreneurs. For this division, some universities have recalled personnel from corporations. Thus, a division in charge of lifelong learning should be set up in the area of humanities as well.

Finally, the more advanced and complex our society becomes, the more dissatisfied middle-aged and older people become with their level of educational attainment. Thus, the necessity of ongoing education for professionals and other citizens as well as their desire to learn will increase. How to properly respond to that need will be the *raison d'être* of institutions of higher learning and a key to survival in the competition among them.

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Sudasna, P. Bansomdejchaopraya Rajabhat University, Thailand. Speech Technologies in Developing Second Language Pronunciation Skill

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ABSTRACT

The main goal of this article is to integrate the two seemingly disparate fields, speech technologies and second language (L2) pronunciation training. The article begins with the basic characteristics of speech technologies, focusing on the articulatory and the acoustic speech synthesis and some of the software previously available for this purpose. The supporting evidence from previous research and the results of the present preliminary study conducted in Thai students who learned English pronunciation at Bansomdejchaopraya Rajabhat University are reported. Actually, further studies are required to investigate the importance of different factors in the use of speech technologies in teaching pronunciation skill and to support for the further implementation of this technique in L2 pronunciation teaching and learning. It is concluded that speech technologies can be used as an effective tool in developing L2 pronunciation and various speech technologies should be implemented to develop English pronunciation of Thai learners.

INTRODUCTION

As we enter into the age of computer networking and electronic information exchange, the evolution and the application of highly advanced computerized speech technologies for pronunciation developing, such as the articulatory and the acoustic synthesizers, look promising. The creation of hardware and software programs for speech synthesis will be able to quickly and accurately extract the articulatory and the acoustic features of speech signal and display these patterns on a computer screen. In this way, the instructors can use the speech programs to provide the language learners with real-time information about their pronunciation. The application of speech technologies in developing pronunciation allows the learners to compare their own pronunciation with their teachers' or native speakers' pronunciation. Also, the instructors and the learners can visualize the exact features that need changing.

With these functions of the computerized speech technologies, many researchers (for example, De Bot 1981, Molholt 1988, Kewley-Port et al. 1991, Anderson-Hsieh 1992, 1994, Anderson and Kewley-Port 1995) agreed that speech technologies are very effective as learning and teaching tools in pronunciation training. Several studies have revealed the significance of using speech technologies in pronunciation developing. For instance, De Bot (1983) found that using visual and audio-visual input focusing on displaying speech analysis is an effective technique in pronunciation teaching and learning. The study of Anderson-Hsieh (1992) revealed that if students practice their pronunciation and they can see visual pitch curves of their speech comparing to a native speaker's pitch curves, the students will more easily replicate the native speech.

Thus, in this paper, we will look at the use of speech technologies as the teaching and learning tools in second language (L2) pronunciation. The first section, we will start at the topic of articulatory and acoustic speech synthesis and explore some of the software devoted to the analysis and visualization of speech signal. The second section, we will survey briefly the results of previous research in the use of speech technologies in developing L2 pronunciation teaching and learning. In addition, the preliminary study conducted in Thai students, who studied English pronunciation at Bansomdejchaopraya Rajabhat University will be demonstrated in the third section. The final section,

the further implementation of using speech technologies in pronunciation teaching and learning will be presented.

BACKGROUND TO SPEECH DESCRIPTION AND SOFTWARE

In this section, we will focus on two subfields of speech description: articulatory and acoustic phonetics approaches, and some of the commonly used speech analysis and synthesis software.

Articulatory Phonetics Approach

Articulatory phonetics has long been dominated in the study of pronunciation (Laver 1970). In studying articulation, the phonetician is attempting to document how we produce speech sounds. That is, articulatory phoneticians are interested in how the different structures of the organs (see Figure 1), called the *articulators* (tongue, lips, jaw, palate, teeth etc), interact to create the specific sounds. In the articulatory phonetics, the sounds of speech are produced by manipulating parts of the articulators. As these articulators move, a wide variety of sounds are produced, and if the performance is adequate (as it usually is), the sounds are the sounds of speech. For example, the sound [f] is manipulated with the lower lip and the upper teeth. In addition, it is produced by allowing the airstream to flow over the center of the tongue, rather than the sides.

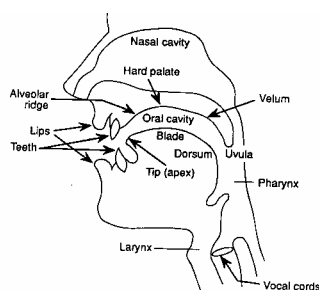


Figure 1: The Articulators
(Adapted from Wardhaugh 1977)

The articulatory phonetics approach has been incorporated into a computational system, or known as *Articulatory Analysis* and *Synthesis*. This method is a way of speech analysis and synthesis by controlling the speech articulators (e.g. jaw, tongue, lips, etc.). One of the most recent software in articulatory approach is called *Articulatory Synthesis System (ASY)*. ASY is a system, which is developed at Haskins laboratories. ASY is designed for studying the linguistically and perceptually significant aspects of articulatory events. Thus, this software synthesizes speech through control of articulators instead of acoustic variables (Mermelstein 1973). The system provides a description of the positions of the major articulators: lips, jaw, tongue body, tongue tip, velum, and hyoid bone position (which sets larynx height and pharynx width), including a description of vocal-tract shape.

As can be seen in Figure 2 below, there are 6 important articulators in ASY: the tongue body center (C), the tongue tip (T), the jaw (J), the lips (L), the velum (V), and the hyoid (H). In the ASY Model, the movement of an articulator is the coordinates of the movements of the other articulators. For example, the moving of lips is related to the position of the jaw, that is, lip opening or closing is a function of the jaw opening and closing. Also, the vertical and horizontal movements of the hyoid are the integrated action of the muscles connecting the hypoid to the jaw, and the tongue. Thus, in the ASY actual program, the vocal tract can be reconfigured by clicking on one of the articulators and repositioning it. For instance, as can be seen in Figure 3, the tract shapes generated (by interpolation) during the synthesis of /da/. In the synthesis of /da/ used in this example, there are two important articulatory frames. First, the tongue tip is raised to touch the alveolar ridge (behind the teeth). Second, the jaw dropped, and the mouth opened wide. The amount of time that it takes to move in this example takes approximately 75 msec. During this period of rapid movement, 8 intermediate tract shapes are generated by linear interpolation (a process similar to morphing).

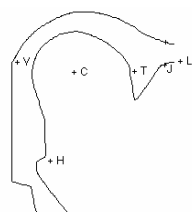


Figure 2. The Model of the Human Vocal Tract.
C: tongue body center; H: hyoid; J: jaw; L: lips;
T: tongue tip; V: velum



Figure 3. The Model of the Human Vocal Tract in Pronunciation /da/.

Acoustic Synthesis

The acoustic analysis and synthesis of speech attracted a great deal of research in the 1950s and early 1960s (Lehiste 1967). In the studies of acoustic technologies, there is a variety of computational techniques being applied to the study of speech analysis. In this section, we will look at the ways of acoustic speech synthesis, including the software that are commonly used in the acoustic analysis and synthesis.

Waveform (Oscillogram)

Physically the speech signal is a series of pressure changes in the medium between the sound source and the listener. The most common representation of the speech signal is the oscillogram, often called the waveform. Inspection of Figure 4a, in the waveform, the horizontal axis from left to right presents the time and the curve shows how the pressure increases and decreases in the signal.

Fundamental Frequency (Pitch, F0)

Another representation of the speech signal is the one produced by a pitch analysis. Speech is normally looked upon as a physical process consisting of two parts: a product of a sound source (the vocal chords) and filtering (by the tongue, lips, teeth, etc.). The pitch analysis tries to capture the fundamental frequency of the sound source. The fundamental frequency is the dominating frequency of the sound produced by the vocal chords. According to Ladefoged (1993), speech sounds possess a complex spectrum since energy radiates at many different frequencies. The English nasal sound [m], for example, has a lower concentration of energy which radiates at a frequency between 250 and 300 Hz. In Figure 4b, the fundamental frequency (often called F0 to be coherent with the terms for the formants, F1, F2 etc) is plotted against time. The F0 curve is visible only at points where the speech is voiced, i.e. where the vocal chords vibrate.

Spectrum

According to general theories, each waveform may be described as the sum of a number of simple sine waves, each with a particular amplitude, frequency and phase. The spectrum is the distribution of energy as a function of frequency for a particular sound. The spectrum (see Figure 4c) gives a picture of the distribution of frequency and amplitude at a moment in time.

Spectrogram

The sound spectrogram was invented in the early 1940s (Koenig, Dunn and Lacy 1946, Potter, Kopp and Green 1947). As can be seen in Figure 4d, the sound spectrogram provides graphic records of the acoustic energy in any given speech. These graphic records are the measurement of amplitude, intonation, pitch, duration, and frequency. The results of the measurement will be shown on a spectrogram display of voice patterns and pitches.

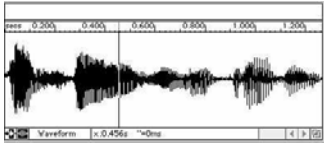


Figure 4a: Waveform (Oscillogram)

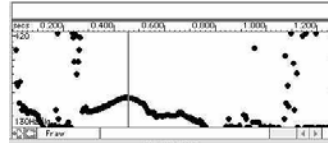


Figure 4b: Fundamental Frequency

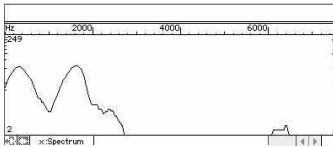


Figure 4c: Spectrum

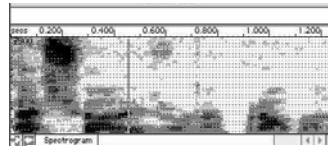


Figure 4d: Spectrogram

Figure 4: The Acoustic Synthesis of Speech: (a) Waveform (Oscillogram), (b) Fundamental Frequency, (c) Spectrum, and (d) Spectrogram

In the study of acoustic speech synthesis, there is a variety of software programs that capture and display the acoustic aspects of the speech signal (Llisterri 2004). In this paper, we will look at some of the common programs. An example of programs is a product of the Kay Elemetrics. This product is called *Computerized Speech Lab (CSL)*. As can be seen in Figure 5, with CSL, users are able to view the real-time speech parameter easily.



Figure 5: The Computerized Speech Lab Program

However, there are the other shareware programs, which are known to be of good quality. For example, *Speech Tools 1.5* and *2.0*, and *WinCECIL* and *MacCECIL* are developed by SIL (SIL 2004). The components of *Speech Tools 1.5* and *2.0* and *Speech Manager 1.5* and *2.0* include speech analyser. The users can view sound file as a waveform, pitch plot, spectrogram, spectrum and various F1 vs. F2 displays. *WinCECIL* and *MacCECIL* are another speech analysis software, which was developed from the DOS *CECIL* version 2.1 program by SIL and is used commonly. Using *CECIL*, the users can view speech recording, automatic pitch contours, and spectrograms. In addition, the computer program *PRAAT* is a comprehensive speech analysis, synthesis, and manipulation package. *PRAAT* was developed by Paul Boersma and Dvaid Weenink at the Institute of Phonetic Sciences of the University of Amsterdam, The Netherlands (Speech and Hearing Science and Technology 2003).

THE PREVIOUS STUDY USING SPEECH TECHNOLOGIES IN L2 PRONUNCIATION

In the past, various types of L2 teaching and learning have been studied. As for using speech technologies with a focus on training pronunciation, results of several studies provided the outcomes to support that the integration of speech synthesis in L2 pronunciation teaching and learning can improve students' production skill.

According to the research work of T Hart and Collier (1975), this study sought to provide Dutch learners with necessary acoustic relevant information concerning English intonation such as direction, range, speed, and place of pitch change. The acoustic information was displayed on a computer screen so that the learners could learn correct intonation. The study revealed that the learners showed a significant improvement in the production of intonation. A similar result was shown by the study of Murakawa and Lambacher (1996). In their study, the Japanese students were trained in the pronunciation of English [r] using the computer display of the frequency levels of sounds on the screen. The results showed that after the training, the students improved their pronunciation of [r]. The study provided the empirical data that the display of acoustic analysis is effective as a teaching and learning tool.

From the overview of the previous research, we set the research project to evaluate the use in L2 pronunciation training of computerized speech synthesis in the form of visual articulatory and waveform displays through a pretest-posttest experimental design and 2 weeks of training. We hypothesized that computerized speech synthesis would serve to enhance the successful pronunciation training for English as Second Language (ESL) learners. This research project will be presented in the following section.

THE PRESENT STUDY USING SPEECH TECHNOLOGIES IN DEVELOPING ENGLISH PRONUNCIATION FOR THAI SPEAKERS OF ENGLISH: THE PRELIMINARY STUDY IN BANSOMDEJCHAOPRAYA RAJABHAT UNIVERSITY

Research Design and Methodology

This study concerns the use of speech technologies as teaching tools in L2 pronunciation by Thai speaking learners. The study was set in Bansomdejchaopraya Rajabhat University (BSRU). The research was undertaken over a two-week period. The research methodology was pretest-posttest design to measure the effects of two weeks of English word pronunciation training using the displays of computerized speech synthesis. The research design was schematically summarized in Table 1.

Initial Testing Sounds				Final Testing Sounds			
Training without Speech Synthesis (Control Condition)		Training with Speech Synthesis (Experimental Condition)		Training without Speech Synthesis (Control Condition)		Training with Speech Synthesis (Experimental Condition)	
Pretest	Posttest	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest

Table 1: The Research Design

Participants in this experiment were 20 native speakers of Thai language. All subjects were the second year students majoring in English language at BSRU, Bangkok. All of participants were female and they had never studied English outside the university. They were grouped into 2 groups. Ten participants were participated in the *training condition without the use of speech synthesis* or the *control condition*, and the other ten participants were participated in the *training condition using speech synthesis* as the teaching tool or the *experimental condition*.

For the present study, there were two types of testing words. The first type was words with initial target sounds such as the words 'deer' and 'tear', which the target sounds are initial [d] and [t]. This is called *Initial Testing Sounds*. The second type was words with the final target sounds such as the words 'wed' and 'wet', which the target sounds are final [d] and [t]. This is called *Final Testing Sounds*.

The test tokens in each type were 20 monosyllabic words (see Appendix A). In both types of testing sounds, there were one control condition and one experimental condition. In both conditions, there were 14 *training sessions* of about 20 minutes each during the 2 weeks of training.

For the *control condition* or the *training condition without the use of speech synthesis*, the participants were practiced individually in the training sessions. They were shown each testing word and were instructed to produce each word without the display of speech synthesis as the teaching tool or the feedback. They were allowed to practice the words aloud before recording their pronunciation on the computer. After looking at each word, they were instructed to produce the words into the microphone. The pronunciation of words was stored as separate files on the computer.

In the *experimental condition* or the *training condition using speech synthesis*, the procedure in the training sessions was the same as in the control condition. The difference was that in the training sessions for the experimental condition, the participants' pronunciation was analyzed using WinCECIL. After the participants produced a word, the waveform of a participant's pronunciation was displayed in real time on the monitor screen and played out through the participant. Then, the waveform of a native speaker's pronunciation was displayed to provide the auditory feedback. Thus, the participants were able to compare their pronunciation with the native speaker's pronunciation and were able to change their pronunciation. After the waveform of each word was displayed on the screen, the screen was then cleared and the word was practiced again.

For all conditions, there were *Pretest and Posttest Sessions*. The pretest was administered to the participants on the first day of training period. The test consisted of 20 test tokens. A posttest containing the same target words and using the same testing procedure was administered on the last day of the training period. In the testing procedure, the participants were tested individually. They were shown words printed on a card. After looking at each word, they were instructed to look up and produce the word. The words were recorded on the computer. During testing, there was no display of speech synthesis.

The main hypothesis in this study is that in the training condition with speech synthesis or the experimental condition, it is hypothesized that the learners' pronunciation in the posttest should be significantly better than in the pretest. However, in the training condition without speech synthesis or the control condition, it is hypothesized that the learners' pronunciation in the posttest should not be significantly better than in the pretest.

Results and Discussion

Participants' recorded productions in pretest and posttest testing were evaluated on a 7-point scale ranging from '1' (definitely not native) to '7' (definitely native-like) (see Appendix B). Rating sessions were done by a total of three native speakers of English. Rating sessions were done individually. The raters were given the words on a scoring sheet along with a 7-point scale for the pronunciation rating. All participants' pretest and posttest words were played directly from the computer through the loud speaker for rating. In rating, each participant's pretest and posttest words were randomized. Raters were not told which productions had preceded or followed training. In addition, some native speaker words were included to ensure that raters could rate native-like pronunciation appropriately. These native speaker words received rating of '7' (definitely native-like). Interrater reliability was assessed using the method suggested by Hatch and Lazaraton (1991). A Pearson (r) value of 0.82 was considered satisfactory reliability for three raters.

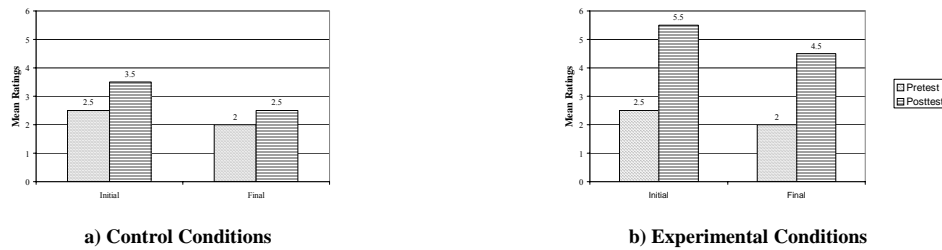


Figure 6: The Mean Ratings of The Initial and the Final Testing Conditions Comparing Pretest and Posttest in the Control Condition (a) and in the Experimental Condition (b)

The mean ratings of the 20 participants in the initial and final testing sounds in the control and the experimental conditions comparing between pretest and posttest are shown in Figure 7. In this study, the data were analyzed using a three-way analysis of variance (ANOVA) considering Time (pretest, posttest), Testing Sounds (initial, final), and Condition (control, experimental).

In the control conditions (Figure 7a), for the initial testing condition, the mean rating in the posttest (3.5) was slightly higher than in the pretest (2.5). In addition, for the final testing condition, the difference between the mean rating in the posttest (2.5) and the mean rating in the pretest (2) was extremely low. In the experimental conditions (Figure 7b), for the initial testing condition, the mean rating in the posttest (5.5) was markedly higher than in the pretest (2.5). In addition, for the final testing condition, the mean rating in the posttest (4.5) was also higher than in the pretest (2). The ANOVA analysis revealed a significant effect of Time [$F(1, 116) = 5.11, p < .01$], indicating the mean ratings obtained in the posttests were significantly higher than those obtained in the pretests. In addition, there was a significant effect of Condition [$F(1, 116) = 9.57, p < .01$], indicating that the mean ratings obtained in the experimental conditions using the speech synthesis were significantly higher than those obtained in the control conditions. However, the analysis did not find a significant effect of Testing Sounds ($p > .10$). Thus, the difference between the mean ratings obtained in the initial testing sounds and in the final testing sounds was not significant. In conclusion, the results indicated an improvement in both initial and final testing sounds comparing between pretests and posttests as a result of training with speech synthesis.

Consider the present study, the results demonstrated the effective application of speech technology in L2 pronunciation training. The question might arise as to whether different types of words will reveal different degree of improvement after the longer training period. However, this study's objective is not to determine whether different sounds will effect the training achievement.

IMPLEMENTATION

The future research directions on using speech technologies as the tools and the feedback in training L2 pronunciation, especially the study in English pronunciation developing of Thai learners, will be conducted at BSRU. The further research is aimed to set up the comprehensive study to investigate different factors, which should be taken in consideration such as language factors and the instructional designs (Nunan 1999) as well as the implementation of this technique for developing English pronunciation of Thai students, at BSRU.

CONCLUSION

This paper considers that using speech technologies is a valuable technique for developing L2 pronunciation. We made the preliminary experimental study in Thai students learning English pronunciation at BSRU to evaluate our technique. We found that using speech technologies in teaching and providing feedback can effectively improve the students' pronunciation skill. It is thus possible to have further comprehensive studies to investigate the additional factors influencing the effectiveness of using speech technologies in pronunciation developing. Beside the further research

study, we hope that this technique will be implemented in the development of L2 pronunciation skill such as developing English pronunciation in Thai students, for instance.

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Tan K.A. Edith Cowan University, Australia.. A case study into successful offshore education export for non-Go8 Australian universities in Hong Kong

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Abstract

Offshore education export for non-Group of Eight (Go8) Australian universities (<http://www.go8.edu.au/>) often requires more effort than for their Go8 counterparts. This is especially true if the targeted overseas partner is a locally prestigious institution. An often quoted anomaly of this is the successful collaboration between Charles Sturt University and Hong Kong University. This paper seeks to explore a different perspective to this successful collaboration and proposes a model for potential successes for other non-Go8 Australian universities in their effort to export their education overseas.

Introduction

The successful collaboration, in the areas of offshore Librarianship and Information Technology (IT) education, between Charles Sturt University (CSU), Australia and the School of Professional and Continuing Education (SPACE) at the Hong Kong University (HKU) has been often quoted (Mills 1999, Chan 2000) as a success model for distance education programs between Australia and Hong Kong. This is more so when considering the fact that CSU is not a member of the Go8 Australian universities and HKU is the most prestigious university in Hong Kong and among the best in Asia.

The initial collaboration between CSU and HKU happened back in 1988 when CSU and SPACE jointly offered the Charles Sturt University-Riverina (CSU-R) Diploma of Arts (Library and Information Science) degree to the students in Hong Kong. The details on how this came about were well documented in (Kan 1997) hence, are not repeated herein. It is true to say that it is HKU that first approached CSU for its librarianship degree program and this successful relationship has later flowed onto collaborations on other CSU programs; include the CSU Master in IT degree now on offer at HKU SPACE.

A different perspective into CSU-HKU successful collaboration

This paper seeks to explore a different perspective into the successful collaboration between CSU and HKU. From this perspective, we will propose a model for potential success for future collaborations between Australian universities, especially non-Go8 universities, and successful overseas partners.

Meeting a local demand

The link between CSU and HKU was initiated by Dr. L. B. Kan, then HKU University Librarian and Director of Library Studies, who identified CSU as the right partner to deliver librarianship education in Hong Kong to meet their local demand for tertiary degree programs in library studies. CSU was chosen primarily for its strong librarianship program in Australia and its strong standing with the Australian Library and Information Association (ALIA). The awards from the CSU-HKU collaboration are also accredited by the Hong Kong Library Association (HKLA). (Kan 1997)

Getting local support

From our understanding a key factor for CSU's success in getting to work with HKU is Dr. L. B. Kan. Not only Dr. Kan was instrumental in bringing CSU's library studies programs to Hong Kong but the very fact that Dr. Kan is also one of the key founding members and Chairperson, on numerous occasions, of the HKLA, (<http://www.hklib.org.hk/history.htm>) also meant that the CSU-HKU program have solid local support from day one.

Tailoring to local needs

A good start never guarantees long term success. With the case of CSU-HKU collaboration, both parties have gone thru much of the pains of fine tuning and adapting each other's working culture and curriculum development to arrive at a high quality suite of programs suitable for both the Australian and Hong Kong students. Once again these growing up pains are well documented in Mills (1999) and Chan (2000) and not repeated herein.

A different perspective

Though much has been written about the successful collaboration between CSU and HKU, these reports (Mill 1999, Chan 2000, Kan 1997, Gorman 1997) have been dwelling on reporting the facts of the matter. This author has a different perspective which may lead to the proposal of a structured approach for successful offshore education export for non-Go8 Australian universities.

Our view of the CSU-HKU success is along the following lines:

1. CSU already have a locally successful program which is well accredited in Australia; (Kan 1997, Gorman 1997)
2. What CSU has to offer actually fills an existing gap in the education needs in Hong Kong; (Kan 1997)
3. CSU has the strong support of a local contact - Dr. Kan, and recognition of a local industry body - HKLA; (Kan 1997)
4. CSU and HKU are willing to work out their differences and fine tune their programs to meet the local needs while maintaining the quality of their curriculum; (Mills 1999, Chan 2000)

A proposal for non-Go8 Australian universities to establishing successful offshore programs

While Go8 Australian universities can rely, in part, on their 'brand' names to get them thru to working with strong partners in offshore programs, non-Go8 universities often have to work much harder to establish a beachhead with the right offshore partner.

Towards this effort, it is the proposal of this paper that when exporting an offshore program, the university should:

1. Export only well established programs with great local support and curriculum that are portable for offshore teaching;
2. First work with relevant local industrial bodies and their counterparts in the foreign country. This is most important to establish credibility and to identify the market needs and positioning of your programs;
3. Have strong local support in the foreign country, if possible within the targeted partner;
4. Be ready to be committed and work closely with offshore partner to fine the offered curriculum to the requirements in the offshore market;

Exporting solid local programs

It goes without saying that if any Australian universities are thinking of offshore programs, they should be only thinking of what is being done well back home. Always export only well established and well received programs at home for an offshore market. With the current globalisation of Australian tertiary education, one good indication on a potentially successful offshore export would be what is popular with overseas students in Australia. The reason is simple: 'If the overseas students are coming in droves to do your program in Australia, then there will be even a greater demand for the same in countries where the students came from.'

Another point to note is to only export programs that are modular and suitable for offshore teaching. Technical programs which entail a mainly hands-on approach on specialised and often costly equipments may not be easily replicated elsewhere.

Working with industry bodies locally and offshore

There is often the lack of this in many of the missed opportunities for Australian universities trying to export their programs offshore. As a matter of fact, the accreditation, support and recommendation for a given Australian university program, from the Australian industry bodies and their local counterparts in the offshore countries, are the best 'calling card' there is.

Moreover, working with these industry bodies, the Australian university can fully understand the needs of their programs in a given offshore country and how to best position their programs in the market.

Having strong local support

Often having strong local support in a given country will allow an Australian university to be abreast with the latest and developments in that market. If the local support is in the targeted offshore partner, it would be even better as this allow support for the Australian university from the inside of the targeted offshore partner.

A good source of such local support for any given Australian university is their overseas alumni network.

Commitment to offshore programs development

Before an established link can be come a successful collaboration, both the Australian and their offshore partners must be committed and willing to work on their collaboration, especially on fine tuning their programs to fits the needs of all, the Australian and offshore students. This takes time and commitment, but most importantly, this requires steadfastness to quality education and trust in the working relationship for all parties.

Summary

This brief paper proposed a simple but potentially effective plan for non-Go8 Australian universities to export their education offshore. The proposal is derived from observations on the success of collaboration between CSU and HKU in Hong Kong. No doubt such an approach can be applied by any university, anywhere, who is interested in exporting their education program offshore.

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Thongprasert, N. Ubon Ratchathani Rajabhat University. Thailand. A Culture-Based Model for Strategic Implementation of Virtual Education Delivery.

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Abstract

This study was designed to examine the critical success factors for implementing Virtual Education Delivery (VED) in Thailand, and to identify ways to facilitate such adoption and lead to effective outcomes. The study incorporated an analysis of three specific factors related to Thai culture: high power distance “Bhun Khun”, uncertainty avoidance “Kreng Jai” and, collectivism “Kam Lang Jai”. This paper reviews the development of the research model, describes the conceptual underpinning of the cultural model and presents the findings of the study. A strategic framework for successful VED implementation is proposed and can be modified for any cultural environment. In addition an audit instrument was developed for evaluation and review of VED outcomes on an ongoing basis.

KEYWORDS: Virtual education delivery; Cultural impacts on IT; ICT in Thailand; Implementing virtual education

Introduction

An accelerating demand for mass higher education is driving universities to change from their traditional classroom setting to long distance delivery models (West and Hore, 1989; Sherry, 1996; Davies, 1998; Peraya, 2001). However, long distance has obvious limitations particularly with regard to on-going student engagement and has led Universities to embrace more interactive instruction models through on-line delivery (Bates, 1993). This has led to widespread adoption and diffusion of Information and Communication Technologies (ICT) within the education sector and a new globalised vision for education delivery.

In this global world, many organisations have adopted the strategic concept of the ‘virtual organisation’ as an alternative business model to gain competitive advantage (Goldman et al., 1995; Graenier and Metes, 1995; Mowshowitz, 1997; Venkatraman and Henderson, 1998; Leimeister et al., 2001). Increasingly, this is a model being considered by Universities to allow them to extend their markets across widely distributed populations and reap the benefits of economies of scale (Castells, 1996; McFadzean and McKenzie, 2001; Clarke and Hermens, 2001). Thailand is a case in point where this model is under development.

In 2002 the estimated population in Thailand was 62.1 million (NECTEC, 2003). Of these 3.5 million had accessed the Internet and the estimated number of Internet users in 2004 will grow beyond 6 million. This growing number of Internet users may have an enormous impact on Thai society and, as the Internet becomes more socially significant, on Thai education (Tao, 2001). There are a number of Thai universities such as Chulalongkorn University, Ramkhamhaeng University etc., which have begun to investigate virtual education delivery systems and moved to an instructional model which allows the instructors, learners, and content to be located in different non-centralised locations by using ICT networks. However, there are some major issues related to the management of the system as an educational tool and these critically influence success in implementing Virtual Education Delivery (VED) in Thai universities.

This study aimed to determine the factors leading to success in establishing a Thai VED and examines the implementation in four universities. Critical success factors are evaluated and inhibitors identified. The specific questions addressed are:

1. What are the factors influencing effective implementation of VEDs in Thailand?
2. How do these factors facilitate successful implementation?

3. How can these be incorporated into strategies for implementation in the context of Thai culture? The paper reviews the development of the research model, outlines the research approach adopted and summarises the results from both stages of the study. Finally, a model for future implementations and ongoing evaluation of VED effectiveness is proposed and an audit checklist designed as an integral part of a new strategic planning cycle.

REVIEW OF SUCCESS FACTORS

According to Alexander and McKenzie (1998), VED success factors can be classified under 3 categories: improved quality and productivity of learning, and enhanced student perception of learning. Table 1 summarises the indicators used to determine levels of success within this study.

Table 1 Indicators used to determine the success of VEDs.

Characteristics of successful VEDs	Indicators used to determine the success.
Quality of learning	<ul style="list-style-type: none"> • A variety of learning styles that meet students' needs (Borthick and Jones, 2000). • Ability to move through learning materials that meets students' needs (Borthick and Jones, 2000). • Adequate information and contents that meet students' needs (Dulworth, 1996). • Accessibility to learning
Productivity of learning	<ul style="list-style-type: none"> • Creation and sharing of new knowledge (Alexander and McKenzie, 1998). <ul style="list-style-type: none"> - provide collaborative technologies to share knowledge - encourage lecturers and students to share ideas and insights .
Positive Lecturer and student attitudes to teaching and learning	<ul style="list-style-type: none"> • Perceptions of lecturers and students in an interactive VED courses (Alexander and McKenzie, 1998).

These factors were evaluated against a theoretical framework developed by Hiltz (1994) identifying four major approaches which could lead to success in the implementation of VED: technological determinism, the social psychology of users, human relations in organisation and the cultural context (Figure 1).

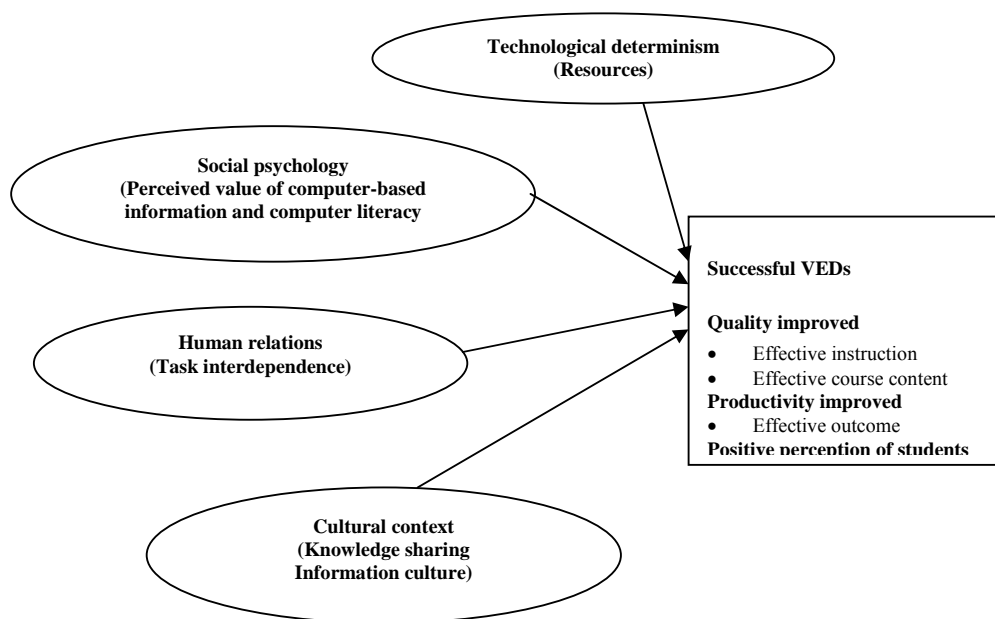


Figure 1. Evaluating Success Factors

These factors are summarised below and those implicit to the Thai context are further expanded.

Factors affecting VED development and implementation in Thailand

Resources

- The resources include all hardware and software but also the efficiency and effectiveness of system design and implementation (Mowshowitz, 1997).

Computer literacy and Perceived value of computer-based information

- This affects both students and lecturers with respect to their expectations from ICT enabled information but further impacts on their abilities to use ICT (Larson and Bruning, 1996; McCollum, 1997; Jarvenpaa and Staples, 2000).

Size of market

- Significant market size is needed to provide sufficient financial return to maintain and upgrade the quality of VED courses (Bodian and Robert, 2001; Green, 2000).

Task Interdependence

- A successful VED requires agreement of members including academics in each major unit. They must perceive its usefulness and collaborate to provide alternative learning styles. Members in Universities must be comfortable with discussion and open decision making to provide education on the Internet (Rada, 1997).

Information culture

- Information culture refers to values and attitudes about information processing, publishing, and communication. Staff and students characteristics and environments such as the institutional context influence information values and attitudes in many ways (Davenport, 1997). A VED can utilise various types of information media such as electronic mail, discussion board, videoconference, web-based learning and etc., but student's preferences will be different (Jarvenpaa and Staples, 2000).

Shared knowledge and competence of administrators, students and lecturers.

- Knowledge sharing is an interpersonal interaction involving two actions: representation, which refers to the ability of an individual to introduce their knowledge and subordination which, is the ability to accept or absorb another's knowledge (Davenport and Pruzak, 1998; Erich and Williams, 1998). Representation and subordination in VEDs, will have an affect on administrators, lecturers and students in their approach to knowledge sharing (Shore and Venkatachalam, 1996). In

particular, Thai culture will impact on this interaction. According to Hofstede, Thai cultural issues, which can be viewed, as barriers to knowledge sharing are high power distance, high uncertainty avoidance and collectivism.

High power distance

High power distance is the first cultural barrier to knowledge sharing for Thai people (Komin, 1990; Mckenna, 1995; Rohitratana, 1998). This refers to the acceptance of a hierarchical authority system with an emphasis on status differentiation and unequal power distribution. Thai subordinates usually accord respect and feel obligations to their superiors as a father figure in their family (Mckenna, 1995). This kind of relationship between those who are in higher positions and their subordinates is called “Bhun Khun” (Holmes and Tangtongtavy, 1995). This might obstruct the process of transferring knowledge through university networks, such as e-mail or discussion board since students are not encouraged to express their ideas to solve problems and lecturers are unlikely to oppose any ideas or opinions expressed by senior administrators.

High uncertainty avoidance

Thai people are characterised as having high uncertainty avoidance (Hofstede, 2001). This refers to being threatened by ambiguous situations and trying to avoid challenging experiences. Thais seek certainty in their relationships and are normally reluctant to be the cause of discomfort to others. This trait can be expressed by the Thai word “Kreng jai” (Rohitratana, 1998). Kreng jai refers to “an attitude whereby an individual tries to restrain his own interest or desire, in situations where there is the potential for discomfort or conflict, and where there is a need to maintain a pleasant relationship” (Holmes and Tangtongtavy, 1995). Subordinates in Thai organisations accept that their superiors make correct decisions and carry these out unquestioningly (Thanasankit and Corbit, 2000). Kreng jai can be a serious impediment to knowledge sharing where a conflict situation may be implied (Trompenaars and Hampden-Turner, 1998).

Collectivism

Thai culture is recognised as collectivist rather than individualist. The sense of collectivism in Thai people is strong as a consequence of their living in extended families (Hofstede, 2001). Thus, the dependency relationship between the person and in-groups is stronger than in out-groups. They usually hold views and opinions respecting the group and this plays a vital role in their learning styles (Hallinger and Kantamara, 2001). This is expressed in Thai as “Kam lang jai” and refers to the spirit and moral support in-group members provide to encourage self-confidence in students and promote knowledge sharing (Hallinger and Kantamara, 2001).

The Research Model

A theoretical research model, which incorporates the factors that facilitate the success of establishing and implementing of Thai VEDs, is shown in figure 2. The main focus of this study was to investigate the factors that have a critical impact and how these factors can facilitate the establishment and implementation of Thai VEDs.

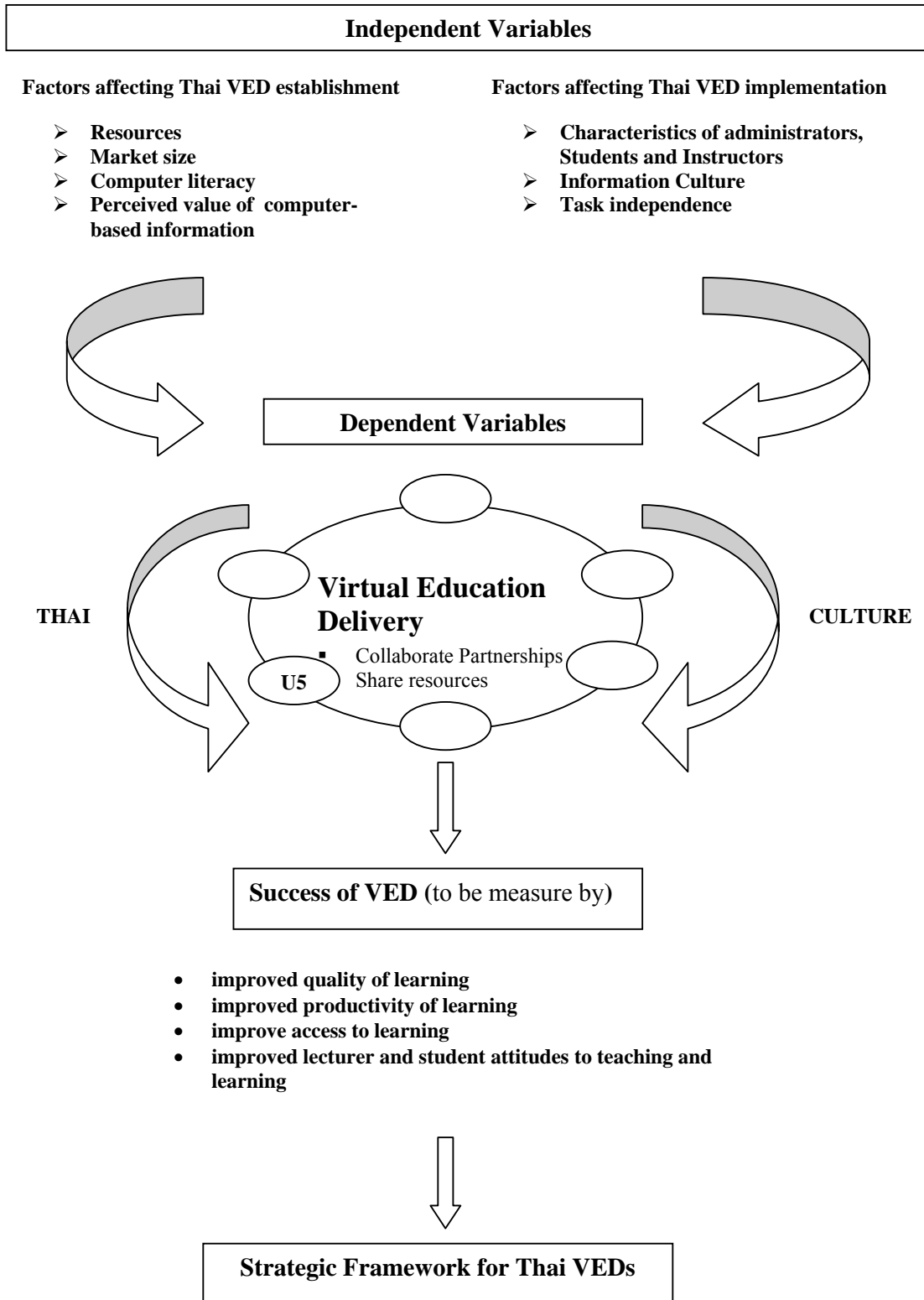


Figure 2. The research model of factors affecting Thai Virtual education

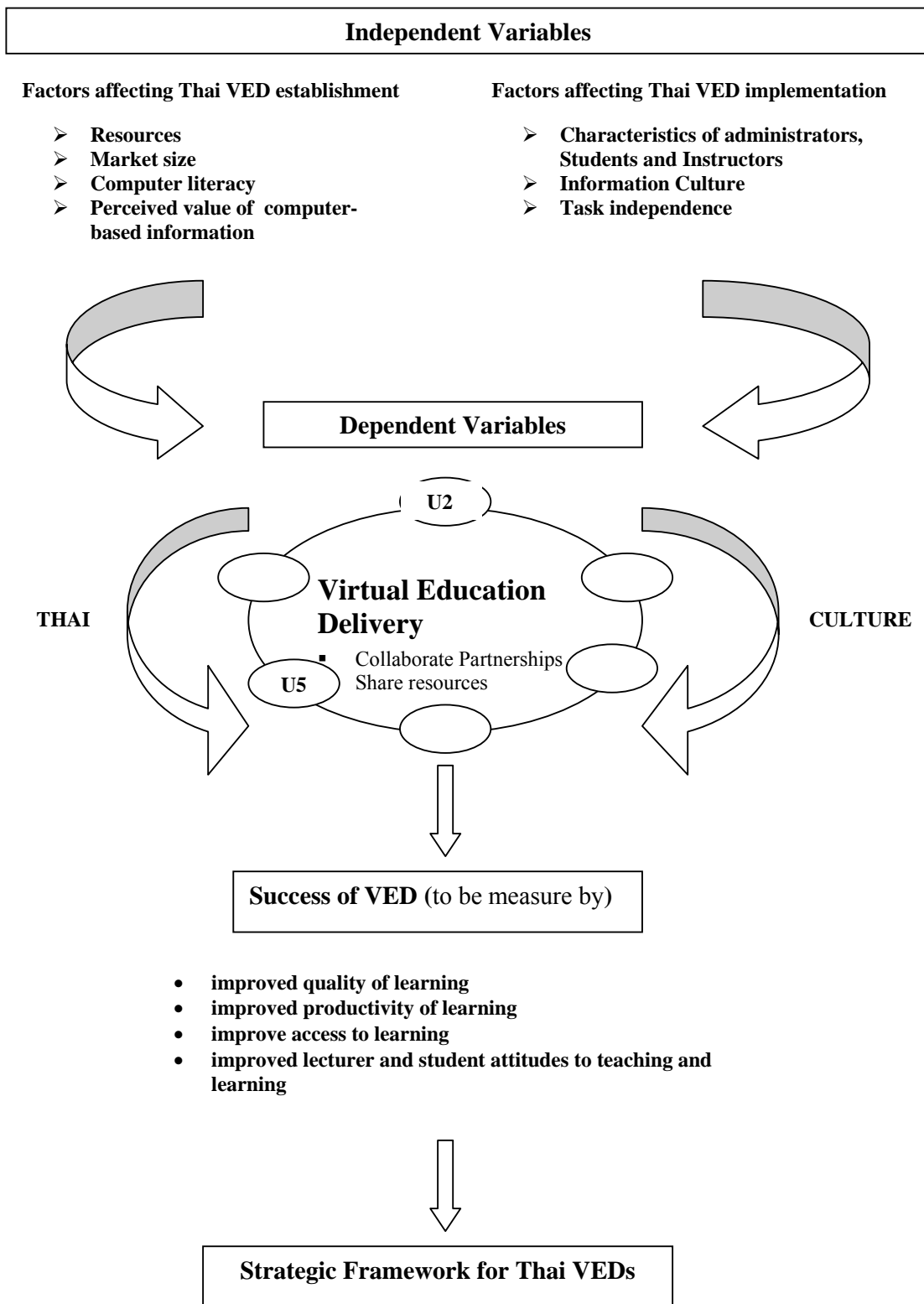


Figure 2. The research model of factors affecting Thai Virtual education

RESEARCH METHODOLOGY

A multi-method research approach including quantitative and qualitative methods was chosen because of the nature of the participants and the scope of the problem. The study used both a survey and case studies conducted through a series of interviews. The survey and interviews were conducted in the Thai language with professional translators validating the instruments and responses. Students completed the surveys whereas the interviews were conducted with instructors, administrators and IT support in each of four Thai Universities. The survey was developed from relevant research and based on the theoretical framework. This was administered to 240 students in four Rajabhat Institutes. 167 valid responses were received giving a response rate of 69.5%. Multiple regression analysis was used to test the relationships between dependant and independent variables. The dependant variable was the success of VED interpreted in terms of the effectiveness of quality, productivity and student perception of their courses. Independent variables were resources, computer literacy, perceived value of computer-based information, culture and information culture.

Multiple case studies through structured interviews were utilised in four Rajabhat Institutes and involved lecturers, administrators and IT support in each. These were analysed through conceptual cluster matrices and then by cross-case analysis to address similarities and differences across the group. Finally the results from the survey stage were analysed against the results from the case studies and an integrated cross-case comparison developed. The results from these several stages were used to refine a new model of VED success and to create an audit tool for use in evaluation of VEDs.

The Research Hypotheses

Hypothesis A: The five factors: resources, computer literacy, perceived value of computer-based information, characteristics of students' culture and information culture will significantly influence the perception of Thai VEDs

Hypothesis B: The five factors: resources, computer literacy, perceived value of computer-based information, characteristics of students' culture and information culture will significantly influence the effectiveness of instruction of Thai VEDs

Hypothesis C: The five factors: resources, computer literacy, perceived value of computer-based information, characteristics of students' culture and information culture will significantly influence the effectiveness of course content of Thai VEDs

Hypothesis D: The five factors: resources, computer literacy, perceived value of computer-based information, characteristics of students' culture and information culture will significantly influence the effectiveness of outcome of Thai VEDs

Data Analysis and Discussion of Findings

Cronbach-Alpha was used to test the degree to which items were independent measures of the same concept and correlated with one another (Cavana. et al., 2001). The reliability coefficient of all research variables averaged 0.9083 implying that the research variables were reliable (Bryman and Cramer, 1999). Construct validity was obtained through a thorough grounding of all questionnaire items within the existing literature (Cavana. et al., 2001; Creswell, 1994; Yin, 1994). Pearson's Correlation Matrix was used to test discriminant validity. The data showed low multi-collinearity (<0.5). This implied that all questions were valid and loaded more highly on their intended concept than on other concepts (Taq, 1997).

Table 2 Characteristics of student participants

Characteristics	Percent
Gender	
Male	56.3
Female	43.0
Age	
18-24 years	82.8
25-34 years	13.9
35-44 years	1.3
Mode	
Normal	62.9
Weekend	35.8
Faculty	
Education	0.7
Management Sciences	11.3
Technology & Industrial Science	25.2
Humanities and Social Science	4.0
Science and Technology	57.6

Hypothesis Testing

Multiple regression analysis was used to test the hypotheses and the following results obtained.

Student perception of VED

Table 3. Results of Regression Analysis-Student Perception of VED

Model	B	F	R	R ²	Adjusted R ²	Std. Error	Standardized coefficient of Beta	p-value
(Constant)	3.246	3.290	0.372	0.139	.097	.953		
Resources						.033	.020	.829
Computer literacy						.159	-.038	.673
Perceived value of computer-based information						.036	.180	.042*
Culture								
- high power distance						.096	-.106	.213
- high uncertainty avoidance						.085	-.089	.323
- Collectivism						.131	.053	.517
Information culture						.065	.325	.000**

Dependent Variable: Perception of VEDs

The outputs in Table 3 show the seven independent variables that were entered into the regression model, the R (0.372) which was the correlation of the seven independent variables: resources, computer literacy, perceived computer-based information, high power distance, high uncertainty avoidance, collectivism and information culture. The dependent variable in this section was the student perception of VEDs. The interrelation of the seven independent variables was taken into account, and the R square (0.139) was significant at the 0.003 level (F value = 3.290). That means that 13.9 percent of the variance (R square) in student perception of VEDs was significantly explained by the independent variables. Among seven independent variables, information culture is the most important in explaining the variance in the perception of VEDs as the highest beta (β) value was 0.325. The second-ranked variable was perceived value of computer-based information with a beta (β) of 0.180. The positive beta weight indicated that if student perception was to be increased enhancing information culture by supporting useful material content on-line, e-mail discussion and supportive university contexts and perceived value of computer-based information would be necessary.

The quality and productivity of learning

Effectiveness of instruction

Table 4. Results of Regression Analysis-Effectiveness of instruction

Model	B	F	R	R ²	Adjusted R ²	Std. Error	Standardized coefficient of Beta	p-value
(Constant)	2.341	5.787	0.470	0.221	.182	1.176		
Resources						.041	.169	.054
Computer literacy						.196	-.097	.259
Perceived value of computer-based information						.044	.105	.210
Culture								
- high power distance						.118	-.125	.122
- high uncertainty avoidance						.104	-.295	.001**
- Collectivism						.161	.025	.745
Information culture						.080	.211	.008**

Dependent Variable: Effectiveness of instruction

The outputs in Tables 4 show the seven independent variables that were entered into the regression model, the R (0.470), which was the correlation of the seven independent variables with the dependent variables: the effectiveness of instruction. The interrelation of the seven independent variables was taken into account, and the R square (0.221) was significant at the 0.000 level (F value = 5.787). That means that 22.1 percent of the variance (R square) in the effectiveness of instruction can be significantly explained by five independent variables. Thus, hypothesis P21-H₀ was substantiated (the null hypothesis was rejected).

Among seven independent variables only culture: high uncertainty avoidance and information culture was significant at the 0.001 and .008 level respectively. The results mean that culture: high uncertainty avoidance was the most important in explaining the variance in the effectiveness of instruction (β = 0.295). The second most important variable was information culture with a beta (β) value of 0.211. The positive beta weight of uncertainty avoidance indicated that students preferred their learning to be controlled by instructors rather than learning by themselves. In addition if the effectiveness of VEDs instruction were to be increased, enhancing information culture by supporting useful material content on-line, e-mail discussion and supportive university contexts would be necessary.

Effectiveness of course content

Table 5 Results of Regression Analysis-Effectiveness of course content

Model	B	F	R	R ²	Adjusted R ²	Std. Error	Standardized coefficient of Beta	p-value
(Constant)	-.009	8.751	0.548	.300	.266	.474		
Resources						.016	.281	.001**
Computer literacy						.079	.036	.655
Perceived value of computer-based information						.018	.167	.036**
Culture								
- high power distance						.048	-.213	.006**
- high uncertainty avoidance						.042	-.064	.432
- Collectivism						.065	.156	.034**
Information culture						.032	.269	.000**

Dependent Variable: Effectiveness of course content

The outputs in Tables 5 show the seven independent variables that were entered into the regression model, the R (0.548) which was the correlation of the seven independent variables with the dependent variables: the effectiveness of course contents. The interrelation of the seven independent variables was taken into account, and the R square (0.300) was significant at the 0.000 level (F value = 8.751). That means that 30 percent of the variance (R square) in the effectiveness of course contents can be significantly explained by resources, perceived value of computer-based information, culture which composed of high power distance and collectivism and information culture. Regarding independent variables, resources were the most important in explaining the variance in the effectiveness of course content as the highest beta (β) was 0.281. The beta (β) value of information culture was 0.269 and 0.167 for perceived value of computer-based information. The positive beta weight indicated that if the effectiveness of course contents were to be increased, enhancing resources, information culture and also perceived value of computer-base information would be necessary.

On the other hand, the negative beta weight of high power distance was -0.213 indicating that if the effectiveness of course contents was to be increased, a decrease in the degree of power distance had to be experienced. However, the positive beta weight of collectivism was .156 indicating that students working in a group-based orientation enhanced the effectiveness of course content.

Effectiveness of outcome

Table 6 Results of Regression Analysis-Effectiveness of outcome

Model	B	F	R	R ²	Adjusted R ²	Std. Error	Standardized coefficient of Beta	p-value
(Constant)	1.325	8.681	.546	.298	.264	.809		
Resources						.028	.155	.099
Computer literacy						.135	-.193	.094
Perceived value of computer-based information						.030	.270	.002**
Culture								
- high power distance						.081	-.032	.576
- high uncertainty avoidance						.072	-.009	.758
- Collectivism						.111	-.004	.834
Information culture						.055	.413	.000**

Dependent Variable: Effectiveness of outcome

The outputs in Table 6 show the seven independent variables that were entered into the regression model, the R (0.546) which showed the correlation of the two independent variables: information culture and perceived value of computer-based information with the dependent variables: the effectiveness of outcome. The interrelation of the two independent variables was taken into account, and the R square (0.298) was significant at the 0.000 level (F value = 8.681). That means that 29.8 percent of the variance (R square) in the effectiveness of outcome can be significantly explained by information culture and perceived value of computer-based information. Among the two independent variables, information culture was the most important in explaining the variance in the effectiveness of construction as the highest beta (β) was 0.413. The second-most important variable was perceived value of computer-based information with a beta (β) value of 0.270. The positive beta weights indicated that if the effectiveness of outcome was to be increased, enhancing information culture and perceived value of computer-based information would be necessary.

SUMMARY OF SURVEY FINDINGS AND COMPARISON WITH INTERVIEW RESULTS

Information culture and perceived value of computer-based information were significant influencers on the perception of VEDs. The greater the levels of IT comfort the greater the appreciation of VEDs. The following independent variables: resources, perceived value of computer-based information, culture: high power distance, high uncertainty avoidance, collectivism and information culture were all significant influencers on the quality and productivity of learning in VEDs. Only high power distance – “Bhun Khun” showed a negative beta weight.

Computer literacy was not identified as an influence.

These results represent the views of the students and need to be considered against the views of the staff obtained through in-depth interviews. Table 7 presents a comparison.

Table 7 Comparison of findings from questionnaire survey and interview data.

Quality, Productivity and Perception of Learning in VED		
Factors	Facilitate/Inhibit	
	Student	Administrator & instructors
<u>Technological determinism</u> Resources	Facilitate	Facilitate
<u>Social-psychological approach</u> Computer literacy	No influence	Inhibit
Perceived value of computer-based information	Facilitate	Inhibit
<u>Size of market</u>	N/A	No influence
<u>Human relation approach</u> Task interdependence	N/A	Facilitate
<u>Culture context</u> Information culture	Facilitate	Inhibit
Cultural aspects of knowledge sharing		
• High power distance	Inhibit	Inhibit
• High uncertainty avoidance	Facilitate	Inhibit
• Collectivism	Facilitate	Inhibit

As can be seen the findings show some interesting contradictions. The staff identify only two facilitators as resources and task interdependence (not evaluated by students). All other factors were seen as inhibitors apart from size of market. These conflicting views are briefly discussed below.

Social-psychological approach

Students did not believe that computer literacy was an inhibiting factor and may well reflect the fact that students overestimate their own abilities in this regard. However, more interestingly, while staff found the level of literacy in students to be an inhibitor they also found their own levels of literacy to be inadequate and were quite frank about their perception of this as a major problem. This is also reflected in their perception of the value of computer-based information where it was found that students placed far greater value on ICT delivered information compared to staff. The instructors cited four reasons for their low ratings of VED:

1. VED did not reduce teaching hours
2. English language barriers on the web
3. Overload of teaching hours
4. Too little time to become proficient in using ICT

Cultural context

Students were comfortable with their information culture and found this a facilitator towards using VED effectively. Staff, however, found that students used the VED system in an unprofitable manner – playing games and visiting chat rooms. Further they themselves felt inhibited by the system and within the universities very little effort was made to develop an information culture with little or no electronic communication between staff. Both students and staff found “Bhun Khun” to be a significant inhibitor to knowledge sharing in an online environment with a teacher centred approach being far preferred as a learning style. This extended even further within the university relationships between instructors and administrators with instructors stating that they would not dare question any decisions made by the hierarchy and similarly would not admit to any problems with ICT usage.

Students believed that VED environments could provide them with a more certain environment and precise and detailed instructions for learning and so saw ‘Kreng Jai’ as a facilitator. Staff perceived this again as a major inhibitor since students did not adopt a self-learning, self-paced approach as allowed by VED and wanted structure and control – specifically being told what to think. Staff also felt less comfortable with not being in control and found the VED threatening. Finally, students found that their preferences for group activity facilitated learning online whereas staff found this again a major inhibitor. This has to be understood within the Thai context where students attended study centres to access the VED system since they did not have computer access at home so in this way students met within their own study groups and worked together online. Staff found that their collectivist approach exemplified by ‘Kam Lan Jai’ prevented them from pursuing individual learning styles, raising questions or presenting novel ideas.

Staff and students views on the success of VED were also collected and measured on a four point scale. These are compared in Table 8.

Table 8 The evaluation of VED in four Rajabhat Institutes

	RIPN		RISD		RIRC		RIPV	
	Student	Admin & Instructor	Student	Admin & Instructor	Student	Admin & Instructor	Student	Admin & Instructor
Improved quality & productivity	2.9	2.7	2.7	2.6	2.9	2.1	2.8	2.6
Perception of usefulness	3	3.2	2.7	3	2.9	2.2	2.8	3.2

Students were generally more enthusiastic about quality and productivity improvements compared to staff views and had similar views about the perceived usefulness as a teaching and learning tool. Staff actually perceived that VED could be a more useful tool than was merited by current quality and productivity gains. The one institute where staff had very low rankings was the only one where the VED system had been outsourced and it was clear within this university that little attempt had been made to develop an information culture with no internal training and very few ICT aware personnel. Nonetheless, overall VED was felt to be moderately successful and the interviews provided many pointers on how to improve future success.

Implications for Theory and Coping Strategies

During the interviews staff were asked to identify the coping strategies they used or could envisage to overcome the inhibitors to VED success. They identified four major areas:

1. improving technologies and providing technical support;
2. increasing IT/IS competency and skills of students and instructors;
3. changing instructors’ attitudes and motivating them to adopt VED as an interactive teaching style;

4. enhancing all members' cooperation and commitment. This led to the refinement of the strategic framework as shown in Figure 3. The research outcomes of this study showed several factors influencing the success of VED implementation in Thailand. These factors are resources, computer literacy of instructors and students, perceived value of computer-based information, culture of knowledge sharing, information culture and task interdependence.

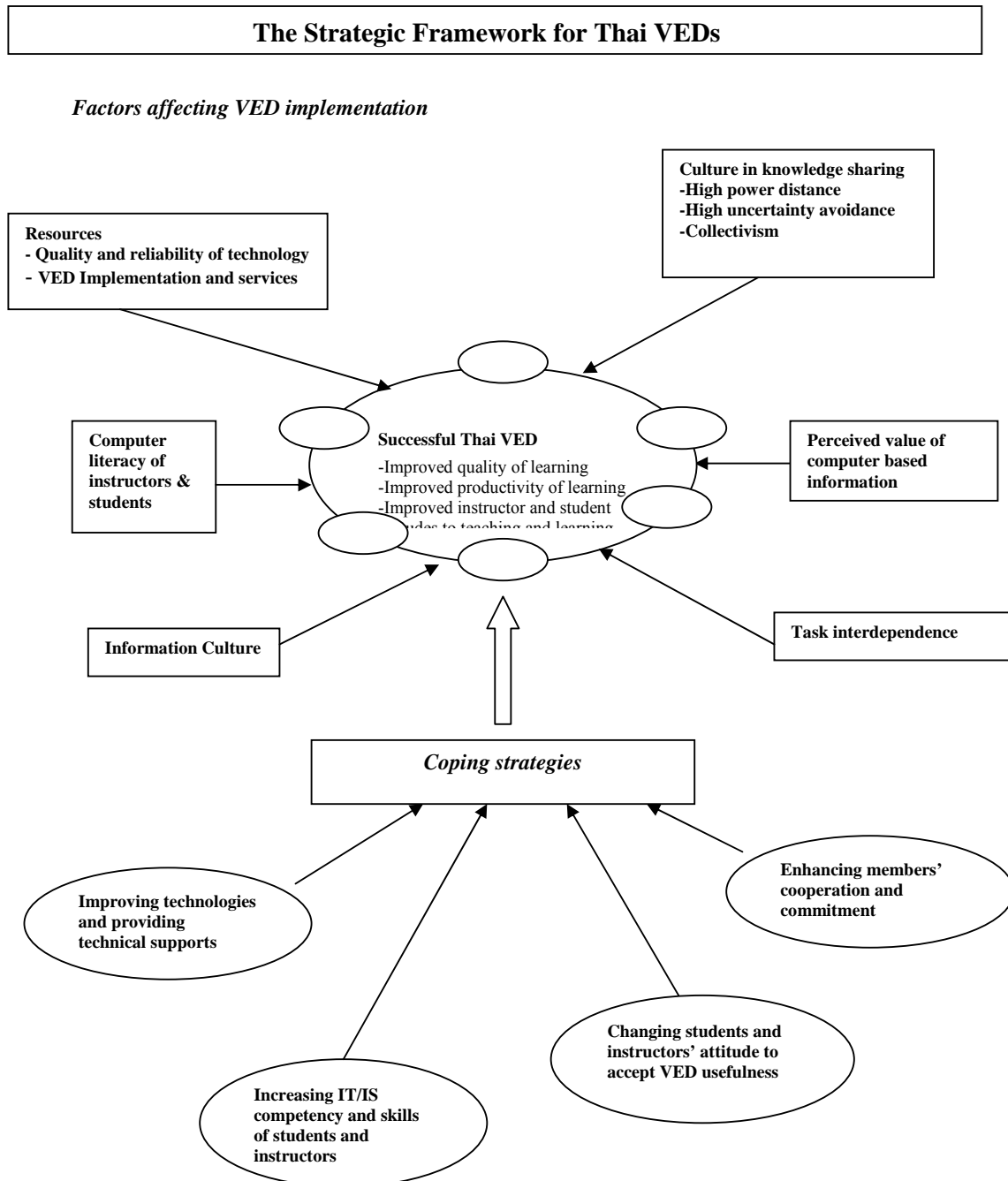


Figure 3 The strategic framework for Thai VED

Resources are seen to be the most important factor that can enhance or inhibit the learning outcome. Two issues are involved: the first is the quality and reliability of the IT/IS infrastructure, and the second is the way VED is implemented and serviced. Computer literacy of students and instructors involves an ability to use the computer and its facilities to enhance studying and teaching on VED.

The perceived value of computer-based information by the participants is also accepted as being critical to the success and further, administrators, instructors and students must realise that using ICT provides them with value and usefulness. Task interdependence and collaboration of members in an organisation is also essential.

Three aspects of culture in relation to knowledge sharing are found to influence the success of collaborative learning in VED. Firstly, there is high power distance between students and instructors and between instructors and administrators. Secondly, high uncertainty avoidance is found to be characteristic of Thai students, and thirdly, Thai students tend to be collectivist rather than individualist. Information culture is the final influencing factor found from the study. This refers to students and instructors' attitudes to use information processing, publishing and communication to perform knowledge sharing in VED learning environment.

Coping strategies for overcoming numerous barriers to successful VED are established and added to the model. These are improving technologies and providing technical support, increasing IT/IS competency and skills of students and instructors, changing students and instructors' attitude to accept VED usefulness, and enhancing the members' cooperation and commitment.

NEW STRATEGIC PROCESS

In order to implement such a strategy, a new strategic process including audit checklists for staff and students was developed as shown in Figure 4

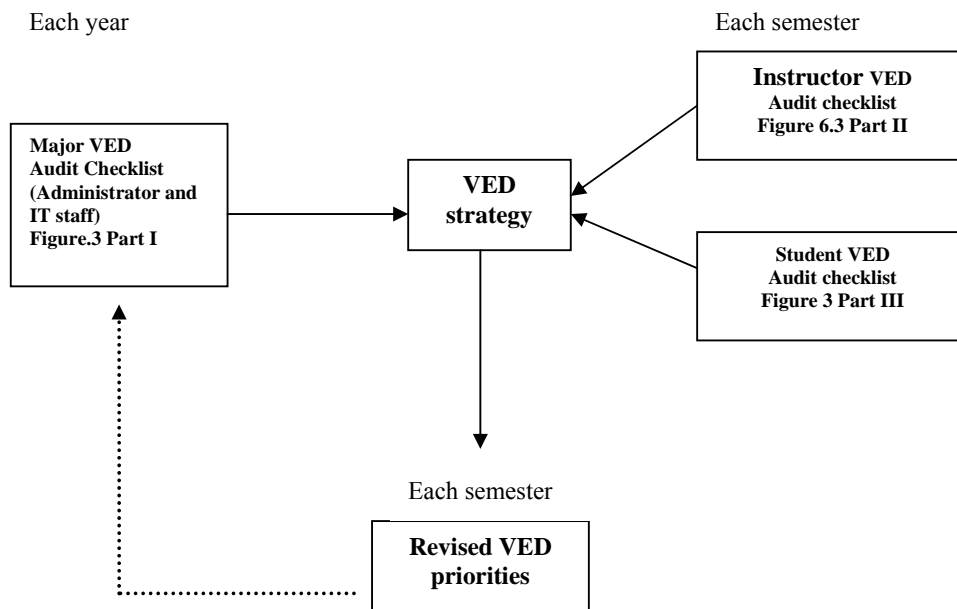


Figure 4 VED Strategic Planning Cycle

Each checklist uses a five-point scale and a sample of the student audit administered every semester is shown below.

Table 9. Checklists for students

Accessibility, collaborative learning and perception of VED?	1	2	3	4	5
How much access do you have to the Web (anytime, anywhere)?					
What is the level of your VED system in terms of user-friendliness?					
What is the level of your VED system in terms of up-to-date content?					
How useful is VED in providing relevant content?					
How valuable do you find VED in assisting you to learn?					
How effective is VED in enabling you to discuss questions or share ideas with other students?					
How effective is VED in enabling you to discuss questions or share ideas with your instructors?					
Are your instructors enthusiastic in providing a VED learning environment?					
How well do your instructors use VED to provide stimulating and challenging instruction?					
How highly do you rank your VED courses compared to standard teaching mode?					

Total points _____

If the total is below 30 (average), your institute needs to take immediate action to improve VED tools and establish a team to mandate information and course content. There is also a need to motivate instructors to provide a more collaborative learning environment through VED.

The staff checklists cover resources, skills, attitudes and commitment as well as effectiveness measurement and will provide a yearly monitor on progress and guidance for improvement.

Conclusion

The main purpose of this study was to examine the strategies used by Thai universities to adopt the concept of “virtual education delivery” as an education tool. The study attempted to determine the critical factors that influence success in implementing Thai VEDs, and identified the ways to facilitate such adoption. These factors were synthesised with Thai environmental and cultural factors to develop a strategic framework which can be used to assist universities in Thailand to achieve more effective implementation of VEDs.

The conceptual research framework was derived from knowledge gleaned from a review of previous research studies. The literature suggested some understanding of the “what” and “how” factors influencing VEDs, but contributed generally rather than specifically to the Thai cultural environment. This framework enabled the researchers to contextualise issues and to determine factors influencing Thai VEDs. This was used to develop the domains of the research questions which were examined through case study analysis of four Thai universities. A multi-method research approach including quantitative and qualitative methods was chosen because of its suitability to this problem. The contexts in determining critical factors influencing the success of Thai VEDs were examined through a survey and interviews. The questionnaire survey was developed from relevant research and based on the theoretical framework. This was administered to 240 students in four Rajabhat Institutes. 167 valid responses were received which was a response rate of 69.5 percent. Multiple regression analysis was used to test the relationships between the dependent variable and the independent variables. The dependent variable was the success of VED interpreted in terms of the effectiveness of quality, productivity and the student perception of their VED courses. The independent variables were

resources, computer literacy, perceived value of computer-based information, culture and information culture. It was discovered that resources, perceived value of computer-based information, culture and information culture were significant influences on the success of Thai VED.

In order to identify recurring themes that could enable the interpretation of another setting, multiple case studies through structured interviews were utilised. This was examined through analysis of four Rajabhat Institutes utilising VEDs. The results from interviewing instructors, IT officers and administrators who were involved in VED were analysed by using a conceptual cluster matrix and cross case analysis to address the similarities and differences across cases. The results of this stage of analysis concluded that poor computer literacy, negative perceived value of computer-based information and information culture (of both students and instructors) were inhibitors to the success of VED. Further, some characteristics of Thai culture: high power distance, high uncertainty avoidance, and collectivism were founded to be critical barriers to knowledge sharing, essential for collaborative learning in VEDs.

Finally, the results have significant implications for administering and implementing VED. These suggested that there are four coping strategies to enhance VED implementation:

- 1) improving technologies and providing technical support;
- 2) increasing IT/IS competency and skills of students and instructors;
- 3) changing students and instructors' attitude to accept usefulness of VED; and
- 4) enhancing the members' cooperation and commitment.

In order to apply these findings in a practical setting an Audit instrument has been developed to allow continuous self-evaluation of the effectiveness of VED in Thai institutes.

Whilst these findings are applicable to Thailand the implementation models and audit evaluation should be equally applicable elsewhere and researchers are encouraged to apply these to determine the specific factors which influence online learning environments in their own cultural context.

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Wang, P., and Webster, R. Edith Cowan University, Australia. Trends and Challenges in Campus and Community Participation for Chinese Students in Western Australia

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ABSTRACT

The formation of strong links and connections between a campus and its various communities is an important part of higher education. Globalisation and the ever increasing size and diversity of the student population produce new demands on the university and its cultural, academic and local communities. With the number of international students from China growing annually and set to increase for the foreseeable future, campuses are challenged to develop meaningful partnerships with communities of people who may not be able to communicate effectively in English. These communities do not always have the experience and ability to enable them to voice their needs and requirements appropriately. Nor are they empowered to build their communities or integrate easily with local academic or non-academic communities. This study draws on the experience of the authors of the educational systems of China, Malaysia, Australia and the UK to compare and contrast the experiences and expectations of a number of Chinese students who have come to study in Australia. A unique perspective is provided by access to data and profiles on a large number of applicants from China. This allows the matching of their progress on their language course in China with their experience in Australia via a survey and a series of interviews. Conclusions are drawn and recommendations made for enabling and empowering members of each community to help integrate into a more cohesive community.

INTRODUCTION

This paper considers issues relating to the participation of Chinese students studying in Western Australia in campus and community activities. A survey of a number of students currently studying in the state is used to compare and contrast their educational experiences in both countries. A distinction is made between the expectations and the experience of the students with respect to their Australian educational journey. Using qualitative data from the survey plus interviews with selected respondents, emergent issues are identified and discussed. Subsequent to the discussion and findings, conclusions are drawn and tentative recommendations made. These are aimed at assisting Australian institutions in further improving the links and connections between the university campus and its various communities. Particular attention is paid to developing support mechanisms for helping Chinese students better integrate themselves with the local campus communities in Australia while maintaining their own sense of identity and community..

In recently years, the international student population in Australian institutions has increased significantly. This has produces new demands on the universities and their cultural, academic and local communities. Campuses are challenged to develop meaningful partnerships with communities of people from a range of different countries. The students have experience of a range of diverse cultural and educational backgrounds as well as having distinct expectations of their overseas higher education experience.

China has become a major international student source for Australian institutions. By the end of 2002, onshore Chinese student numbers had reached around 30,000. This has made China the primary source of international students (Vaile, 2002). According to IDP Education Australia (2003), China was also the main growth driver in 2003, contributing 22% towards the annual growth of international student

enrolment in Australia, with 16,781 students enrolled in that year. Consequently, China became the main source country for overseas students undertaking full-degree programs on-campus in Australia.

This large group of new arrivals are not always capable of integrating themselves with the local academic and non-academic communities in Australia. Moreover, they are often not able to voice their needs and requirements in the new communities appropriately. The reasons for this include the sometimes more limited English language ability of Chinese students, their lack of knowledge of Australia and its educational system and the influence of the different cultural backgrounds and experiences from their previous Chinese universities/schools. The scenario is sometimes exacerbated by the previous experience of Australian educational institutions with students of Chinese ethnicity. These students have usually originated from Malaysia, Singapore and Hong Kong. As such, they have very different English language skills and also greater experience of Western modes of working and socialising.

LITERATURE REVIEW

Several issues have emerged with the increasingly large number of international students studying in Australian tertiary institutions. Issues identified include students' language difficulties, communication problems with lecturing staff, feelings of isolation and difficulties in socialising with local students (Jones et al. 1999; Leder and Forgasz 2004). Burn (1991) reports that international students have more difficulties than local students in coping with academic demands. McClure (2001) emphasises the focus of developing language skills and learner autonomy in international postgraduate students through developing courses to provide a suitable pedagogical environment. Ninnes (1999) suggests that the presence or absence of university and lecturer awareness of the special needs of international students can facilitate or hinder their adaptation to their overseas study experience.

Cultural issues causing concern for international students studying in a foreign country have also been highlighted. Richards (1998) states that international students often have to adjust themselves to the culture in the new country at multiple levels. He points out that these students also need to adjust to the culture of the specific institution in which they are studying. The importance of understanding the hosting country's culture (Kotby 1998) and knowing the culture of the language used there (Richards 1998) are stressed. Volet and Tan-Quigley (1999) point out the fact that diverse cultural expectations could hinder the understanding between international students and administrators of the university and cause a range of problems. Maritiniello (1997) indicates that it is helpful for students to clarify their own individual cultural profiles and diverse characteristics. This can help them to recognise the diversity in other international students in addition to being able to focus on shared characteristics and thus forge a common ground for understanding, respect, and communication. Delaney (2002) also concludes that identifying and appreciating unique characteristics and common bonds among students with diverse backgrounds is the key for realising cultural enrichment through the internationalisation of higher education. Ellis and Heffernan (2002) suggest consideration of implications for inter-cultural learning programs in Australian universities with an international perspective.

University communities are seen as one essential part of international students' overseas education experience. Jordan (1995) demonstrates that it is important to see the international community as it really exists in dealing with international students. Allen and Allen (2003) suggest that universities should attempt to integrate international students into classes and the academic community through a variety of means. The objective here is to help ensure a successful academic experience for the students by encouraging an enjoyable and deep exposure to the local culture. This will also help maximise the value the students can offer to the host academic community. Briffle and Thompson (2004) emphasise this when commenting that:

“Communities are dynamic: they can support or degrade human experience. Communities are tempered by implied purpose, availability of choices, economic situation, and the presence or lack of social responsibility. There are educational implications for teaching and learning in these contexts.” (Briffle & Thompson 2004)

METHODOLOGY

Several initial points need be made with respect to the research approach for taken in this study. The methodology needs to consider the diversity amongst the students in terms of different regions of origin in China, their educational background, age, gender plus how long they may have studied in Australia. This is because the integration of these criteria can provide a more comprehensive backdrop for the analysis of the qualitative data.

The literature review consistently emphasises the areas of language and related cultural concerns with reference to international students integrating into host countries academic communities. However one factor that is seldom considered is the comparative experience of the students in Chinese and Australian universities.

One advantage of the qualitative approach taken in comparing and analysing the experiences of current international students from China is the minimal distance between the researcher and the students. This, though requiring objectivity on the part of the researcher, is a result of both parties having experience of a similar process. Consequently, the study adopts a methodology which includes the use of an email survey of a number of Chinese students studying in Australia. This was followed by e-mail dialogue and further correspondence. In addition interviews were conducted with selected students.

DATA ANALYSIS

The following demographic and general criteria were used to profile the respondents:

- Gender and age
- Educational background
- City of China studied in
- Length of having studied in Australia

The survey questionnaire (see Table 1) comprises four major sections. These include social and academic experiences in Chinese universities/schools and Australian universities.

I: Social experience in Chinese universities/schools

1. How did you spend your spare time while studying in China?
2. Did you make a few or many friends in the university/school? Who were they (classmates, teachers, schoolmates, etc.)?
3. Did you have extracurricular activities on campus? Did you attend some? What kind of activities were they?
4. What did you like most about your university life in China? Why?

II: Social experience in Australian universities

1. What kind of accommodation do you have now? Do you live with Chinese, Australian, or other international students?
2. How do you spend your spare time here?
3. Have you made a few or many friends so far in Australia? Are they your classmates, teachers, schoolmates, or others? Are they Chinese, Australian, or other nationalities?
4. Do you have extracurricular activities at your university? Have you attended some? What kind of activities are they?
5. What do you like most about your university life in Australia? Why?

III: Academic experience in Chinese universities/schools

1. What did you like most about studying at your Chinese university/school? Why?
2. Did you do group assignments? How did you feel about them?
3. Did you consider that it was easy to get help on your study from your teachers, classmates, or other people?
4. Did you use the university/school learning facilities a lot? Which ones did you use often?

IV: Academic experience in Australian universities

1. What do you like most about studying at your Australian university? Why?
 2. Have you done group assignments? How do you feel about them? Do you prefer to work in a
-

- group or not?
3. Do you consider that it is easy to get help on your study from your teachers, classmates, or other people?
 4. Do you use the university learning facilities a lot? Which ones do you use often? How do you compare them to that in your Chinese university/school?

Table 1: A Questionnaire for Chinese Students Studying at Australian Universities

A number of Chinese students studying in Australia were contacted with a view to taking part in the pilot study. Ten students were finally selected as participants. Survey questionnaires were sent to them and returned through e-mail. Four of the respondents were chosen for follow-up interviews. A further two students answered additional questions through e-mail correspondence. Among these Chinese students, 50% are undergraduate students and 30% are males. They have studied in Australia for 1 month to 2.5 years. The students are from 6 different cities of China.

DISCUSSION

A comparison of the participating students' questionnaire responses are summarised and presented in Table 2. Further discussions were conducted via e-mail correspondence and face to face interviews. The respondents experiences and expectations were developed during the conversations and will be covered in the following discussion.

I: Social experiences

	In Chinese Universities/Schools	In Australian Universities
<i>Accommodation</i>	Most Chinese university students live on campus and share rooms with classmates.	Most younger students (22-25) live in shared houses with Chinese students or other Asian students, while most older students (28-36) live in shared houses with other international students or local people.
<i>Spare time</i>	Many mention doing sports and travelling, but none had a part-time job.	No one mentions doing sports or travelling. Instead, they all have part-time jobs. More students mention surfing on the Internet.
<i>Friends</i>	All had many friends. They included classmates, schoolmates, and teachers.	Most have some friends but not many. More younger students have Chinese or Asian friends, but more older students seem to have more international and local friends.
<i>Extracurricular activities</i>	There were many activities on campus. All the students attended some or many of the activities.	Most say there are not many activities or they don't know. Very few have attended one or two activities.
<i>What like most</i>	Most enjoyed living on campus, being with classmates/room-mates.	Most like the freedom and independence of life, multicultural atmosphere, and the beautiful campuses.

II: Academic experiences

	In Chinese Universities/Schools	In Australian Universities
<i>Group assignments</i>	Most did not have group assignments.	All students prefer group assignments, because they are more practical and interesting, besides, it is easier and they can learn from each other. Some point out the importance of having the right partner(s).
<i>Easiness of getting help</i>	Most consider it easy and convenient to get help from teachers and classmates.	Half say easy and half say not easy. Some students mention that they get more help from teachers instead of classmates.
<i>Campus facilities</i>	Half of them used campus facilities often.	Most use university facilities very often. Only 2 students don't use or not often. Some students consider the facilities easier to access and more advanced.
<i>What like most</i>	Some students mentioned that study was easier.	Most enjoy the freedom and flexibility of making decisions of major and timetable. Some mention that they can learn practical knowledge and critical thinking. Some like the way of teaching and independent study.

Table 2: Summary of the Questionnaire Feedback

University social experiences

It is noticeable that the older students are more involved in the multicultural social communities of the institutions, whereas the younger students tend to mix with other Chinese or Asian students only. Four of the five older students, aged from 28 to 36, (mainly postgraduate students) share houses with students from other countries or Australia. The five undergraduate students, aged between 22 to 25, chose to live with Chinese students or their friends from other Asian countries. Similarly, the questionnaire reports that the majority of undergraduate student friends are Chinese or from other Asian countries. But the majority of the postgraduates reported having friends from all kinds of cultural backgrounds.

I have a few friends, but not a lot. Some of them are Chinese, some are from Singapore, Malaysia, Indonesia, and very few are Australian. (Questionnaire feedback of a 25-year-old undergraduate student)

Yes, I have all kinds of friends with various nationalities. (Questionnaire feedback of a 36-year-old postgraduate student)

However, half of the respondents say that their main friendships are with Chinese students. They also reported that main problem stopping them from developing closer relationships with Australian or other international students is their ability to communicate effectively in English.

At the beginning, I tried to talk with local students and make friends with them. Once, I had a coffee with a local student. When we started to talk, I kept asking pardon, because I couldn't understand. It finally became so boring because she was tired of repeating and I was tired of asking pardon... So, we just kept drinking coffee. (Extract of an interview with a 24-year-old female undergraduate student)

Sometimes after study, I really want to relax. But, talking in English is not a relaxation for me. It is more comfortable to talk in Chinese because I don't have to think hard (like) if I speak English. So, most of my friends are Chinese and I live with Chinese too. (Extract of an interview with a 29-year-old female postgraduate student)

Culture and life experience factors also affect the students' choices of housemates and friends. These backgrounds help smooth the conversation and make it more interesting for both sides to continue and further the relationship. A Chinese student who speaks good English also said that she prefers having Chinese friends, because it is easier for them to understand each other and they can easily find topics that they both are interested in.

The Chinese students who have been in Australia for a while have more experiences and tips to share with the new arrivals. Consequently, it is easier for them to settle down if they choose to live with other Chinese students or make more Chinese friends. Several students mentioned that they got most help from Chinese friends when they first arrived in Australia.

When I first came to Australia, I lived with other Chinese students who came earlier. They gave me lots of help, such as telling me which bank is best for international students, where to buy the cheapest international phone cards for calling China... (Interview extract)

The survey shows that the Chinese students have very different spare-time activities while studying in Australia than in China. All these Chinese students did not have a part-time job while studying in China, but now, they all do part-time work besides their study. Three students, who used to do sports

in their Chinese universities/schools, don't do sports that much in Australia. All the survey participants mentioned that in their Chinese universities/schools, there were more activities on campus and they attended some or many of these activities. However, when talking about Australian universities, most say that there are not many or they do not know. Only 20% have attended one or two extracurricular activities in their current universities.

In China, you could see many students playing sports on campus. It was easy to join a sport with them and find friends to do sports together because we all lived on campus. But, there are not many sport grounds on campus here... it is hard to get together with friends or classmate as well. (Interview extract)

Most of my friends have jobs. It is easy to find jobs here and the pay is good too. Besides, I can meet more people and practice my English... I don't have much time to speak English in university, actually. (Interview extract)

Working makes me more independent and mature. (Interview extract)

Question: Did you have extracurricular activities on campus? Did you attend some? What kind of activities were they?

Answer: *Yes, we had many. Yes, I attended some. I played ping pong (table tennis), basketball, and other sports.*

Question: Do you have extracurricular activities at your university? Have you attended some? What kind of activities are they?

Answer: *No. I haven't found any... 55555 (feeling very bored) But I'd like to play basketball if they have this sport in our university. (Questionnaire extract)*

In Australia, these students get more chance to integrate themselves into the local community through part-time jobs. It gives them experience of communicating and dealing with people from diverse countries with different cultures. There are economic reasons too, but at the same time this makes them feel more independent than in China.

Since most Chinese university students live in dormitories on campus, and the universities provide most living facilities for students, there is a more comprehensive social community on Chinese institutional campuses. Students do not only study on campus, but also spend most of their spare time on campus. They eat in cafeterias, shop in campus stores, play sports on sports grounds, watch movies or TV on campus, etc. It is also easier for them to meet other students and become friends. Comparatively, most Australian universities do not provide such extensive facilities for students. These new arrivals may feel isolated from their classmates and teachers because of the physical distance. But, part-time work becomes one important factor to integrate them into the non-academic community. Having friends and housemates who they can communicate with easily helps build their local communities.

The respondents' feedback on the questions "What did/do you like most about your university life in China/Australia?" gives examples of their experiences in the institutions of both countries as well as their expectations of studying overseas. Most of them enjoyed living in dormitories on campus. It provided a good opportunity for them to make friends with many other students. They also then did sports together and spent their spare time together. On the other hand, the responses also reflect that these students enjoy their social lives in Australian universities as well. Several students mentioned the freedom and independence of life; Other respondents said that they liked the multicultural atmosphere in Australian universities, while two specifically mentioned the beautiful campuses and friendly environment in Australia.

Question: What did you like most about your university life in China? Why?
Student A's answer: *The various activities, very interesting and exciting*

Student B's answer: *A lot of extracurricular activities. I could stay with classmates and schoolmates (because I lived in dorm).*

Student C's answer: *University life gave me lots of experience in sharing and how to deal with people.*

Student D's answer: *I enjoyed the relationship with all my roommates. They are very kind and we have lots in common.*

(Questionnaire extract)

Question: What do you like most about your university life in Australia? Why?

Student C's answer: *I like the multicultural atmosphere here, which gives me some opportunities to meet people from different countries with different language and culture. Generally speaking, I like the diversity.*

Student D's answer: *Multiculturalism. I can understand and know other countries cultures.*
(Questionnaire extract)

I think studying in China, our social lives were limited to the campus; but studying in Australia, we have a social life within and outside the university.

(Interview extract)

In the interviews, some students also talked about what they do not like and find difficult in their social life in Australian universities. Experiences of a lack of campus atmosphere and community and difficulties in getting together with classmates and teachers made them miss their university lives in China. The respondents considered that Australian universities do not provide the same kind of campus community that they experienced in China.

Generally speaking, I enjoy my life studying in Australia, especially the multicultural experience on campus. I like to meet students from different countries. Knowing different culture is very exciting... But, I wish we could have more chance to meet other students. I can only meet my classmates when going to class, but after class, everybody leaves school immediately. We don't have much time to talk to each other... I often miss my Chinese university life so much. Everybody lived on campus. We got to know many students and have more friends gradually. It could happen when we were waiting in the queue for buying meals in the cafeteria, watching movies in the university open-air cinema, or doing self-study in a classroom... I knew almost all the girls who lived in our dormitory building. I knew everyone in my class and I had many other friends as well. But, now I don't. I never felt lonely, but now I feel lonely quite often. (Interview extract)

University academic experiences

The survey shows that students have less opportunity to complete assignments in a group in Chinese universities. Nine out of the ten students said that they experienced no group assignment work in their Chinese universities. In contrast all students mentioned that some, often half, of the assignments were required to work in a group in Australia. Several of advantages were mentioned in the questionnaire feedback, such as group work being interesting, practical, easier to complete the work, and providing a good opportunity to learn from each other. Four students pointed out the importance of having the right partner(s) in the assignment group.

Question: Have you done group assignments? How do you feel about them? Do you prefer to work in a group or not?

Yes. Sometimes it's good coz it can inspire (me) but sometimes it's just a waste of time. Having a good partner is important. I prefer to work by myself. (Questionnaire extract)

Yes, nearly half of our assignments are group assignments. I like group assignments since I enjoy teamwork. I'm able to share my opinion with other people who may has (have) a

different background of different culture. Then I can learn something different from them. Also, its easier to do a job with others than by myself. (Questionnaire extract)

Yes. It's great. We can help each other. (Questionnaire extract)

In China, students have learned to be responsible for their own assignments instead of cooperating with other students. Since they may lack experience, some students do not have the skills of sharing ideas, communicating properly and respecting other people's different opinions and work. Some students also find it difficult for them to adjust their own standards and ideas of completing the assignments to those of other group members.

I think it is good for me to work in a group sometimes, but not all the time. I find I can always learn something from everyone. It is also a good opportunity for us to become friends. But, I also find it hard when we have different standards for the achievements. It is very hard for me to adjust. Should I keep my high standard or lower it to fit other group members? But, it is good (if) we are allowed to choose our own group members. (Interview extract)

Doing group assignments provides Chinese students with a good opportunity to learn to collaborate and cooperate and to feel involved in the academic community. It helps the students to learn practical skills which will be required in their future work. Chinese students realise this and find that this meets some of their expectations of studying in Australia.

The study also shows that half of the students find it difficult to access personal help from their lecturers and classmates in Australian universities. This was in contrast to the relative ease of access experienced in China. This subset of respondents suggested the following reasons:

- Difficulty in discussing questions with lecturers/classmates in English
- Not convenient because appointments with lecturers must be made for inquiries
- Not much chance to see classmates after class

Question: Did you consider it was easy to get help on your study from your teachers, classmates, or other people (in China)?

Answer: *Yes, I can ask my teachers anytime when they were in school or even after school. I could also ask my classmates at anytime since we lived together.*

Question: Do you consider that it is easy to get help on your study from your teachers, classmates, or other people (in Australia)?

Answer: *Compared to Chinese universities, its not as easy as that in Chinese school. Teachers seem always busy and are just available on some certain days. I have to make an appointment with them if I wan to ask questions. As to classmates, it's very difficult to ask them questions after class unless we use a mobile phone.*

(Questionnaire Extract)

The students who were used to living on campus in China and having easy access to teachers and classmates find it frustrating to try and get personal help from their lecturers and classmates in Australian universities. This is especially true at the beginning of their studies in Australia. However, the longer the students have been in Australia, the easier they think it has become to get help from their lecturers and classmates. This suggests that they need a period of time to adjust to these different circumstances.

Question: Do you consider that it is easy to get help on your study from your teachers, classmates, or other people?

It is easy to get help from the lecturers; usually we can communicate via email.

(Questionnaire extract)

(This student has studied in Australia for 2.5 years.)

Not really. (Questionnaire extract)
(This student just arrived in Australia one month ago.)

Again, the majority of students (eight out of ten) use the university facilities, such as library and computer labs more often than in China. Some students mentioned advantages of computer labs in their current universities, such as easy access and convenience. In addition, students find that by using the Internet they can access unit information, do research, communicate with lecturers and classmates, and keep in touch with their friends.

I often use the library and unit website. We use the Internet more often in Australia than in China. And I found that the Internet is an effective means of communication. We can get the first hand information easily. (Questionnaire Extract)

When asked about what they like most about studying at the Australian universities, most students answered that they enjoy the freedom and flexibility of making decisions, such as selecting majors, units, and their own timetable. The ability to learn practical knowledge and critical thinking was also considered important. The different approach to teaching and the encouragement of an independent learning style is appreciated. However, they also feel that studying overseas is a great challenge for them in terms of the language and different learning skills required. On the other hand, some students indicate that their studies in Chinese university were comparatively easy because of the language and the learning style that they were used to.

One student answered these two questions as follows:

In China: *Study is easy, it doesn't take much time to get a satisfactory result.*
In Australia: *Challenging. Studying in Australian is not as easy as study in China. In Australia, I got lots of assignments and reading stuff every week, but time is pressing. I have to guarantee reading quality and have to learn about time management.*
(Questionnaire extract)

During further conversations through e-mail and interviews, the students were asked to talk about their difficulties and what they did not like about their study in Australian universities. Almost all of these students believe that language is the primary obstacle for their studies. The second obstacle is developing an understanding of Western culture, especially the related active and independent learning styles. One student thought that personality is the most important factor for improving their experience of study and life in Australia.

The first semester was really tough... I had to study very hard to barely finish text book readings and complete the assignments, not to mention reference books and journal articles recommended by our lecturers. I did not do any part time work at all, because I was just so busy with my study. But, the second semester looked much better. I still had to work very hard, but I found it easier to deal with readings of textbooks and reference papers, and it took me less time to do assignments too. Oh, besides, I managed to do 10 hours work per week as well. I think, for our international students, we are not only learning our units, we are also learning the language, learning how to learn and how to live in this Western country. The first semester is especially important. (Interview extract)

Sometimes it's very depressing... because I don't know how (to) describe questions and even don't understand what the lecturer is talking about. So, after a few time(s), I don't want to ask questions... just leave them there. (Interview extract)

Several students also talked about how they felt overloaded with information during the orientation when they had just arrived in Australia. There seems to be all kinds of schemes for assisting international students settle down and lots of information on how to live and study in

Australia and in this particular university. However, the students often feel a little confused at times because of the amount of information they are expected to absorb in a relatively short period of time. This often occurs immediately upon arrival, when they are going through so many new experiences. Consequently, their sometimes limited language ability can impact more seriously on their capacity to assimilate lots of new information. They used the following terms to describe the complex feelings experienced during this period of time:

- Excited about everything
- Scared and confused about many things
- Feeling very lonely

CONCLUSIONS

This initial study is a pilot study for a planned larger study. Consideration of the experience and expectations of Chinese students' at their Chinese and Australian universities/schools has led to the identification of several issues which will be explored further at a later date. It will be useful to reflect here on how members of each community can integrate more effectively into a more cohesive community.

In Australia, many Chinese students are unable to integrate into the universities' social community for a variety of reasons. Limited English language and consequent communication ability is the first obstacle. Even with good English, many students still find difficulty in engaging influential and enjoyable communication with local or other international students for other reasons, such as different cultural and life experience factors. At the same time, it is easier for them to get help from Chinese peers, especially if they are new arrivals. Another important reason is that Australian universities often do not meet their expectations in terms of the campus atmosphere or community. This is usually very different from their experiences of Chinese university campus life and can cause them to feel very isolated from their classmates and teachers. Most Chinese students have enjoyed an active campus life in a very different atmosphere in China. They usually considered it the most important element of their social life at university in China.

On a more positive note, the academic experiences in Australian universities are often more enjoyable for Chinese students. Firstly, most of them appreciate the Western teaching and learning styles. In comparison with their Chinese universities, they enjoy the active classes, the freedom and flexibility of making their own decisions, and the independent style of learning. Doing group work and learning practical knowledge and critical thinking are what they did not learn in their Chinese universities. At the same time, they use the libraries and computer labs more often than in Chinese universities due to easy access and high quality of the facilities.

However, the same students can still experience several different difficulties in the academic communities of Australian universities. First of all, language remains the biggest concern. Being unable to express themselves and understand their classmates and lecturers tends to make them feel less confident than in China. Secondly, when compared to the easy access to their teachers and classmates on campus in China, students find it difficult to get help in their studies in Australia. Some are not used to the different methods of communication and are unused to making appointments for inquiries. Since students do not stay on campus after class, they cannot get help from their classmates easily as in their home student experience. Third, a lack of experience of working in a group sometimes causes difficulties of collaborating with their partners. Finally, and often crucially for it underpins the rest of their experience, most students find that the orientation sessions are often ineffective because of the problems of information overload and language familiarity.

RECOMMENDATIONS

The following recommendations from the pilot study are suggested as a basis for Australian institutions to explore ways of establishing strong links and connections between a campus and its

various communities. A particular focus should be the buildings of additional supporting mechanisms to help students from China integrate better into the academic and non-academic communities in Australia.

Firstly, international student orientation sessions are a good means of introducing information on living and studying in Australia. However, more consideration should be given to students' language ability and the effectiveness of the transfer of so much information for these new arrivals. It is suggested that a progressive approach lasting for about 1-2 months during the 1st semester may be suitable and more helpful for the students. The sequence of the supporting programs needs to be considered. Additionally, during this period of time, other Chinese students who have studied in Australia for a while can be most helpful for these new students. Supporting groups or social activities could be organised to help new arrivals in the integration process.

Secondly, for Chinese students to integrate themselves in various university communities, it is essential that all international and local students understand and respect different cultures. More public lectures, workshops, traditional art performance or exhibitions on campus could enhance the students understanding of each other and help build harmonious multicultural campus communities.

Further, universities could consider developing facilities and activities which encourage all students to stay on campus longer. This provides opportunities for Chinese students to meet with other international and local students and have more chance to exchange ideas and build friendship with them. It also helps build a more intensive academic and social atmosphere on campus. Besides, this will help improve the ability of Chinese students to develop their language and communication skills as well as to develop a better understanding of different cultures, social norms and approaches to learning. Moreover, although organised sport is usually well developed on Australian university campuses, the provision of a variety of casual sporting activities could provide additional opportunities for all kinds of students to get together and increase their enjoyment of university life.

Finally, suitable channels should be available for these international students to actively voice their needs and requirements. This would help universities to continually improve its understanding of different student experiences and provide support for the integration of university communities. While universities might consider that they address many of these issues already, a lack of awareness of their efforts amongst key groups of overseas students can exacerbate the problems. Part of the problem may well be that the originator of the support programmes view the situations through the lens of their own experiences. One of the authors was at a meeting addressed by a senior international liaison person who commented that the arriving Indonesian students should be ahead with their studies, as they had not been celebrating Christmas. This ignored the fact that Ramadan ran through part of November and December that year and that Hari Raya had been celebrated in late December. This is not an example which is relevant to Chinese students, but the principle holds.

The Chinese student population is the fastest growing group of international students for Australian institutions. It could eventually make up the largest proportion of overseas students in the academic and non-academic communities of these universities. Although it is recognised that many institutions have always addressed some of these issues, it is felt that further attention could be paid to those identified above. Much of the experience of Australian universities with students of Chinese ethnicity has been with students from Malaysia, Singapore and Hong Kong. The language skills and cultural experience of these students has meant that their transition to higher education in Australia has been much smoother. Recognising the different educational, social and cultural experience of students from China can both help the students to integrate more effectively into Australian academic communities and make Australia an even more attractive destination for the steadily increasing numbers of students from this region. The concerns of Chinese students should be recognised and ways of addressing these concerns found. In this way, Australian institutions will not only continually support their overseas visitors in building their communities, but will also help to empower them to integrate more easily with the campus academic and social communities. The results will be beneficial to all parties.

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Webster, R. Edith Cowan University, Australia. Personal Interfaces for Collaborative Learning

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ABSTRACT

This paper considers the use of learning profiles and learning technologies for individual and collaborative learning support purposes. An initial model, developed with 64 students taking a level 3 unit is presented where the participants took part in a study which investigating the use of learning profiles in web-based learning environment design. This model has been extended and developed with a cohort of more than 300 pre-university students taking a university preparation unit entitled "Learning at University". The original model considered the use of student learning profiles for constructing multiple interfaces for interacting with learning environments. For the purposes of both studies, a learning profile is considered to consist of measures of an individual's cognitive style, learning style and personality. The need for students to become more actively involved in the management of their own learning implies an associated need for each student to be more aware of and to increasingly draw on his or her personal resources. The first section of the paper provides an overview of the background to the background to the research and is followed by a discussion of the methodology of the original study. The following section considers several student comments on the perceived impact of the measures on the learning environment development process. Three levels of interfaces afforded and enabled by the learning environment development process are then considered before student perceptions of study related issues and processes are presented. The subsequent section deals with the introduction of the technique of drawing Rich Pictures to help each student to draw out issues relating to the social and interactional elements of learning. The main aspects of the methodology have now been implemented as a university preparation unit, Learning at University, and both elements are considered in the context of their acting as a learning system before conclusions are drawn and briefly discussed.

INTRODUCTION

Recent changes in higher education have produced a set of circumstances that need a new approach to supporting and enabling student learning, both at an individual and collaborative level. A large number of factors have changed dramatically from even 10 and certainly 20 years ago; especially in the UK and Australia (many of these changes occurred earlier in the USA, although the web related changes are similar for all). The number of students has increased significantly. The number of academic staff has stayed largely the same. The backgrounds of the students have become more varied, with some universities having more than 50% mature students. Levels of funding may have risen in absolute terms, but the resources per student have decreased considerably. And then there is technological change. Ford et al (1996) recognised this and when considering the management of change at an organisational level stated:

'These are massive changes, and there is growing recognition they cannot be sustained on the basis of traditional models of teaching and learning alone. It is clear that if HEIs are going to adapt successfully to very different circumstances, and respond effectively to the changed expectations of students, employers and society as a whole, then it will be necessary to rethink the ways in which teaching and learning are supported.'(Ford et al, 1996, p2)

One way of rethinking learning support, for both individual and collaborative learning, can be to develop the metacognitive skills of the individual student by using individual cognitive profiles to help construct personal interfaces for interacting with learning environments. Here, a cognitive profile is considered to consist of measures of an individual's cognitive style, learning style and personality. The need for students to become more actively involved in the management of their own learning implies an associated need for each student to be more aware of and to increasingly draw on his or her

personal resources, including the components of his or her cognitive profile. Although the student is developing a personal and individual learning environment, much of the process is collaborative in nature. Students work in groups and discuss, compare and contrast their own and their peers learning preferences. This process helps to raise their awareness of the variety of learning preferences that exist and help them to understand that there is no single 'right' way to go about learning.

METHODOLOGY OF ORIGINAL STUDY

Three well known and reliable measures, Riding's Cognitive Styles Analysis (Riding & Rayner, 1998), Entwistle's Approaches and Study Skills Inventory for Students (Tait et al, 1998) and the Myers-Briggs Type Indicator were used to develop the cognitive profile. Computer-based and self-report tests for each of the above measures were administered to a group of 64 students participating in a Human Computer Interaction unit. The results of the tests were made available to the students within one week of each measure being administered. The students were then asked to reflect on and write about their thoughts on the accuracy and relevance of the measures. Later in the unit, each student had to develop a web-based Individual Learning Environment (ILE) to a series of learning related information resources. This required the application of elements of the cognitive profile to the design and development process. In addition, the students were asked to document the reasons for their design. A range of qualitative and quantitative measures was collected. Student reflections on and responses to the process were considered via the use of a questionnaire, reflective journal and interviews. The comments on the form and content of the websites created contained in the documentation were also analysed.

Two related metaphors were used to help the students to conceptualise the design of the ILE. The first was that of the Learning Resource Centre (LRC). One definition used was:

'The Learning Resource Centre is a meeting place for all those who wish to learn. It is the electronic hub of the university and our surrounding communities, linking us to the wider global community. It harnesses new technologies effectively to make learning more adaptable and flexible and more widely available. The LRC is at the centre of the university's concept of a new learning environment. This environment focuses all our available resources into a teaching and learning strategy based on our understanding of the changing trends in the learning community'

While the derivation of the term is implied in the following quotation:

'The project 'Learning Resource Centres: Why and How?' evolves from current pedagogical developments in Denmark e.g. demands for individualisation, responsibility for own learning, organisation of learning possibilities including tutoring, quality, college environment issues and the use of IT.'

The second metaphor was that of the ILE conceptualised as a small personal house which the student could enter and find the personalised learning resources in a set of rooms design to support each specific learning activity. This is a similar, but more personal and individual use of the 'house' metaphor to that used in the 'Bookhouse' (Pejtersen, 1989).

Cognitive Style (CSA)

The figures for the CSA are a simple frequency count for each of the four main classifications. The distribution of the cognitive styles as measured by the CSA (Table 1) show that the largest category is the analytic-imager, comprising nearly one third of the population (32.8%). Also, while the verbaliser and imager categories are almost evenly split between the groups (51.6% and 48.4%), there are more analytics than wholists (57.8% and 42.2%).

Learning Style (ASSIST)

The frequencies for ASSIST reflect the sequence of the strength of the scores for the three learning styles - deep (D), strategic (S) and surface/apathetic (A). ASSIST returns a score for each of the styles

and these were converted to percentage scores to indicate a sequence from most dominant to least dominant.

The three learning styles have been put in sequence from most dominant to least dominant style. The two categories Surface-Apathetic/Deep and Deep/Strategic comprise the largest groups in the sample with 33% and 34%. However, although the largest single Surface-Apathetic category contains only 11% of the sample, the number of students having the Surface-Apathetic category as either the dominant or second dominant style comprises almost 33% of the total.

TABLE 1

Instrument/Dimension	Frequency	Percentage
Cognitive Style (CSA)		
Analytic-Imager	21	32.8%
Analytic-Verbaliser	16	25.0%
Wholist-Imager	10	15.6%
Wholist-Verbaliser	17	26.6%
Learning Style (ASSIST)		
ADS	7	10.9%
ASD	3	4.7%
DAS	8	12.5%
DSA (Deep/Strategic/Apathetic)	27	34.4%
SAD	3	4.7%
SDA	21	32.8%
Personality Type (MBTI)		
Extroversion(E)-Introversion(I)	30 – 34	47% - 53%
Sensing(S)-Intuition(N)	35 – 29	55% - 45%
Thinking(T)-Feeling(F)	49 – 15 7	7% - 23%
Judging(J)-Perceiving(P)	29 – 35	45% - 55%
Total	64	100.0%

Table 1: Summary table of the distribution of the profile instruments used

Key ASSIST): D - deep , S - strategic, A - surface/apathetic

Personality (MBTI)

Although there has been and continues to be a debate on the reliability of the MBTI (Bayne, 1995; Nowak, 1996), its widespread use in higher education studies and close connection to measures of learning and cognitive style (Morgan, 1997; Scholl, 1999) led to it being adopted. In terms of student preferences for learning environments, two recent studies (Hulme, 1996; Lynch & Sellers, 1996) have investigated the possible role of personality type in general and the MBTI in particular for identifying preferences for learning environments. Another aspect of personality type as measured by the MBTI is that it distinguishes between individuals who prefer to work collaboratively and those who prefer to work alone (Myers et al, 1999).

The dichotomous frequencies for the MBTI, which indicate the overall distribution of the population along each main dimension, show that for three of the categories - E/I, S/N and J/P - the distributions

are almost even. The remaining category, T/F shows a strikingly different pattern with almost four out of every five student taking the unit being classified in the thinking category rather than the feeling category. This may well reflect the nature of the subject area and its perception by the student body.

STUDENT COMMENTS

A large number of student comments and qualitative data were sought and received via various methods. Reflective journals were used to facilitate reflection on each individual's cognitive profile. Interface documentation described the design and development process of the ILE and again related it to elements of the cognitive profile. Brief examples are given below.

Cognitive Style (CSA) -Reflection

The students often found the Cognitive Styles Analysis (CSA) to be an accurate measure of their cognitive style as described and discussed in class and the readings.

'I have always been puzzled as to why teachers would always recommend to us to draw diagrams to help us understand better as I have always found diagrams to be more of a bane than a boon.'

(wholist-verbaliser)

'In learning, I agree that I prefer to have the facts set out in a clear structured order and that diagrams and pictures help a great deal.' (analytic-imager)

'I received an Analytic score of 2.24 and a Verbal score of 0.89. More so an analytic than a verbaliser which also illustrates that I may be more of a 'bimodal' person ... (that is – either imager or verbaliser). Viewing information in an analytic form as described in a CSA format, I tend to separate it into parts. This is evident in the ILE as the use of LHS and RHS frames segregate the choice and display of relevant of information.' (analytic-verbaliser)

Learning Style (ASSIST)

The learning style measure, ASSIST, was the most accessible of the measures in terms of reflection. This was because both the main scales and the sub-scales (interest in ideas, organised study, fear of failure, etc.) use terms which are perhaps more comprehensible and related to the day to day aspects of learning than those used by the other two measures.

'When it comes to university, and in the context of what I am learning, unless it is a theoretical unit I would much rather be given all the facts than what people may be thinking or assuming. I'd rather be able to think about the given information myself and form my own opinion.' (SDA – Strategic 72%, Deep 65%, Surface 45%)

'In looking at ASSIST, the aspect that struck me was in the Strategic Approach. I scored particularly low in this area: 45% for organising study, 55% for alertness to assessment demands, 35% for time management. I think the reason for this may be because of my tendency to lose track of (the) objective when I am reading or doing research. I can get carried away in what I am reading and read out of interest rather than to fulfil the objectives for the assignment or exam.' (DAS – Deep 79%, Surface 59%, Strategic 51%)

' From the ASSIST results, I discovered that I need to know how the new pieces of information I am exposed to are interrelated. Therefore, when designing my ILE, I will try to link the pieces of information so that they appear to be chunks of information instead of bits and pieces of information..... Finally, I am quite systematic and organised. This applies not just to revising for exams but to every aspect of my life. I need order. Therefore, my ILE should be well organised.' (SDA – Strategic 99%, Deep 95%, Surface 68%)

Personality (MBTI)

This is the measure the participants were most familiar with, several having taken the test previously. In those cases, there was a greater metacognitive awareness of their attitudes to learning and studying..

'I agree with the part about perceptive people, that 'They start many tasks, want to know everything about each task.' When learning, feedback is important to me. And yes, I tend to leave things to the last minute, to 'seek information to the very last minute', emmm...okay.'

This is later linked to the ILE design as follows:

'Structuring the navigation so that the resource pages would open in separate windows was so that I could have all the information in front of me at one time..... the MBTI results confirm that in one of my dimensions I am constantly looking for information before making a decision. Therefore, I would rather have 5 windows open showing all the possible information to learn from, than just one to concentrate on.' (INFP - 5, 27, 5, 5)

COGNITIVE, VIRTUAL AND ORGANISATIONAL INTERFACES

Further analysis and subsequent work has suggested that students can use personal cognitive profile knowledge to develop a series of different but individually related interfaces. Each interface serves a separate but important function in helping the student to develop a series of strategies for interfacing with the university at different levels – the personal, the virtual and the organisational.

The first interface operates at the level of self-awareness. Here the knowledge and understanding of an individual's cognitive profile provides a framework in which that individual can better formulate a series of learning strategies (based on e.g. subject, course, year, semester, unit etc.). These learning strategies then become part of the learning resources on which the student can draw.

The second interface operates at a more functional level and consists of a web-based interface for information management purposes. The development of the first interface will help inform the design and development of the second interface. In addition, besides being structured around the individual student's cognitive profile, the awareness of preferences in terms of the format and content of educational materials helps each student to interact more effectively with learning materials.

The third interface is at the level of the virtual organisation. The techniques associated with Checkland's Soft Systems Methodology, (Checkland & Scholes, 1990), especially rich pictures, root definitions and conceptual models, are used to help each individual student to locate himself or herself at the centre of an organisational learning system. Again, the development of the first two interfaces serves to enhance the students understanding of the individual aspects of their own learning requirements in the context of the university as learning system. This technique is illustrated further below.

The development of the concept of the three interfaces has been the product of several related iterations of the initial study in a series of taught units over the past three years. Much of the above scenario will be more fully operationalised in a unit called 'Learning at University' with 300 pre-university students in the first half of 2004. Feedback from this iteration of the study will be included in the conference presentation. A more detailed explanation of the initial research and the theoretical background of the overall research project is reported more fully elsewhere (Webster, 2002).

INITIAL ANALYSIS

The initial period of analysis involved using the quantitative data to provide a broad overview of the profiles, responses and attitudes of the respondents. This was done using the data from each of the cognitive profile measures plus the quantitative data from the survey. However, as would be expected and as suggested by Summerville (1999), the qualitative data provided much greater insights into the individual aspects of learning.

The student comments and associated qualitative data indicated that engaging in the process of reflecting on the characteristics of one's own individual cognitive profile did have an affect on the design, development and content of the individual learning environment. Several students queried their prior lack of knowledge of this type of information and commented that they would have preferred to

have access to this type of metacognitive information in their high school (or even their university) careers.

The participants often had a vague awareness and sketchy understanding of their preferences for information handling, but this remained in an unstructured and unfocused form. The information from their cognitive profile gave them an opportunity to look at this scenario and their preferences in a much more informed and structured manner. This then helped inform the ILE design, from the perspective of an impact on both the structure and form of the environment. Feedback and comments indicated that the CSA and its dimensions provided the most useful data and criteria in terms of developing the 'look and feel' of the ILE. The MBTI and ASSIST measures also provided personal learning and information processing preference details and these, while having less impact on the design and construction of the ILE, proved useful with specific reference to the learning process. This then impacted on the ILE in terms of materials accessed to support learning preferences.

More important, however, was the manner in which several students commented on broader aspects of their learning experiences and approaches to learning and sometimes identified key incidents which affected their learning development. Others commented on the difficulties they had in adjusting to the different demands of studying at university. They also pointed out that the way they studied in the later parts of their time at university was very different from that adopted in the earlier stages. The manner of this transition appeared to be a random one, often enabled by personal recognition of the problem and self-help or the requested intervention of a lecturer, tutor or counsellor.

STUDENT PERCEPTIONS OF STUDY RELATED ISSUES AND PROCESSES

The reaction quoted below illustrates a not uncommon theme which emerged from talking with students during the period of the unit, interviewing a subset and reading the comments made in various forms of the assessment – reflective journals, design documentation etc.

'From this opening statement, I found myself questioning my own ways of learning and trying to answer those questions...how do I learn and why? How I learn has become more clear to me after doing the cognitive styles test and the MBTI test. Not necessarily from the final results but from the test process itself, going through and answering those questions, made me think about...how I think!!' (Student 24 reflecting on the sentence 'What we learn depends on how we learn, and why we have to learn it.')

These comments indicated that, as discussed above, the primary utility of developing the ILE was to get the students to engage in a structured manner with as many aspects of their learning as possible. Some further examples are categorised in the following sections.

Resolving issues

Student 24 also discussed an incident in her earlier life where the question of learning (or not learning) a particular task (the piano) had caused her to have to resolve the issues involved. This was also something commented on by several respondents and tended to have had a cathartic effect in each case – i.e. a situation involving learning had come to the fore for a variety of reasons which generally impacted on the student's day-to-day life. The student then had to attempt to resolve these issues and move forward. Sometimes the student was able to resolve the issues him or herself, as in examples 1 and 2. More often, discussion with a teacher or other professional helped gave the student a framework to work within. One explanation could be that, having been told that the situation is normal and given a way to deal with it, the student now had an operational framework to function within. That is, the intervention was crucial. Prior to this, the unresolved problem disrupted the students' learning activities to the extent that they either sought help through the intervention of a teacher or recognised that they either had to do that or find a resolution to the problem themselves.

Understanding studying and 'Fear of Failure'

For example, Student 61 reported two transformative experiences of different types. The first was social and related to an incident when the student was 13 years old. At the end of one school year she found that she

would not be in the same class as her friends the following year due to poor grades. She relates how the experience remains a vivid memory but that from that point onwards she determined to study hard. The second incident occurred in the first year of university when she compared herself and her results with a friend whose results were consistently better. This puzzled the first student as she considered herself at least as able, if not more so, that her friend and she worked equally hard at her studies. Consequently she sat down with her friend and worked through their contrasting modes of study. From this she worked out (without the labels) that two dominant traits of her learning characteristics she her preference for a deep reinforced by a strongly analytic cognitive style. The student successfully adapted her approach to learning to include more holistic and strategic elements

Student 51 provided an interesting contrast with Student 61 in terms of the 'Fear of Failure' sub-scale on Surface/Apathetic scale of the learning style instrument, ASSIST. Student 51 commented on her low score in this area by saying *'An interesting point is I don't have a very high fear of failure. I believe my fear of failing is low because I will not let myself fail so it really isn't a fear.'* Student 61, however, appeared marked by the incident reported above and the resulting separation from her friends. She attributed her 'Fear of Failure' score of 95% directly to this experience and commented *'I can vividly remember the day when my fear of failure emerged and sadly, it has remained till this day.'*

Student 51 also took a broader perspective for the results of the personality type instrument, MBTI and considered that her personality affected her approach to studying and learning. She reported that she had changed her mode of study during her time at university and was an able and successful student despite commenting that:

'I hate studying because I find it very boring and used to find myself reading the content for the first time during the exam study break instead of studying. Now I have learnt that you have to prepare and that you cannot improvise otherwise you jeopardise your grades.'

Student 51 also found being confronted with the cognitive profile results meant that *'I had to sit down and think about how I study'*. This was considered to be a useful exercise, despite her already having worked out more effective study strategies because *'school and uni don't teach you to study.'*

Surface learning for successful learning?

One interesting approach to surface learning as a successful strategy emerged in discussion with Student 57, who had a dominant score of 75% for the Surface Apathetic sub-scale of ASSIST (Deep – 53%, Strategic – 51%). When asked about this she said that when at school she felt she had to really understand something before she could move on. Not doing so, made her physically sick. She discussed this with a teacher who suggested that she try to just accept factual things at face value and not worry too much about the issues behind. For example, she commented in her reflective journal: *'If I'm told that leaves are green because of chlorophyll, I just accept it and don't try to find out how or why etc. I think I changed because I got too stressed out having to know 'why' for everything.'*

In the follow up interview she expanded on this by explaining that *'The teacher said just rote learn it, don't understand it, just learn it – and I've got to understand things. I used to feel sick if I didn't understand it and now I don't bother trying to understand it anymore. I just 'that's what it is' I just remember it. If I try to understand things too much I just get all worried and I get all stressed out and feel sick so that I think it's Just better if I accept it.'*

(Student, 57, interview transcript)

Successful Professional Intervention

It is difficult to comment on the advice of the teacher to Student 57 to 'just rote learn it', without knowing more about the overall situation. However, a more structured and perhaps more successful intervention in the long term occurred with student 17. Who, when having difficulty with her studies in year 12 (*'I wasn't doing well. I couldn't prioritise.'*) went to see the school psychologist. The psychologist helped her to recognise that she needed to work out a plan, stick to it and be in control of her studies. Student 17 also said that the psychologist had told her to just do one hours study on a normal evening and then relax and watch TV if she

wanted to. She commented that this work very well and that she became much more relaxed about her studies while being much more successful. She was however, very structured in her approach to her studies and commented: *I have my plan and plan each day. I stick to my plan..... I try to finish final assignments at least two weeks before the deadline, otherwise I panic.*'

Successful Personal Intervention

Student 64 had also worked hard to overcome difficulties he identified in his approaches to study and learning. He had recognised a problem with extracting information from book and developed a strategy to overcome this: *'The only way I learn from a book is to take the text, write it out and draw links between the relevant bits. I need to visually work out how it all fits together.'*

He also considered that the transition from learning at school to learning at university was extremely difficult. This was at least in part because he had a 'study pattern' which he found was not appropriate for university commenting that: *'when I came out of school I had a very different study structure. If I'd known once you arrive at uni it's very difficult to change..... which is what I did, its a very, very difficult thing to do. My first year was very mixed and I spent a lot of time working on the way I study.'*

Because of this experience, Student 54 felt that the issue of the differences in study expectation at university should be address at school. He was very much in favour of the adoption of a process of reflection on measures like those in the cognitive profile and suggested that they should be introduced as early as year 10, i.e. two years before the university entrance examinations because: *'once you settle into a way of studying it becomes very difficult to change.'*

EMERGENT ISSUES

Consideration of these and other examples from the difference types of data sources, especially the reflective journals, process documentation, survey comments and interviews indicated several emergent issues.

First was that the real impact of the cognitive profile measures was in enabling the students to reflect on their learning habits and processes in a structured manner. The actual scores were less important that providing each student with a set of relevant learner categories and characteristics – whether imager or analytic, extraversion or intuition, interest in ideas or fear of failure – which could be used to think about their own learning experiences.

In addition, the responses suggested that both the range of issues students considered as affecting their learning and the manner in which these issues interacted was very wide yet produced an individual mix for each student. This outcome appeared to support the comments of Summerville (1999) and Pillay (1998) on the need for a more process based approach comprising the collection of qualitative data.

Social issues, the intervention of others or the need to make sense of a process which students felt they should understand – how to study effectively at university – yet clearly didn't, indicated a need for a revision and extension of the methodology and learning system.

The Use of Rich Pictures

This section briefly deals with the introduction of the use of Rich Pictures to the process and research. The Rich Picture, a technique drawn from Peter Checkland's Soft Systems Methodology (SSM) (Checkland & Scholes, 1990) and was introduced after the initial research and Human Computer Interaction unit iteration. The purpose of its introduction was to see if it could be used to draw out issues relating to the social and interactional elements of learning. It then provided the basis for the 'organisational interface' by allowing the student to place him or herself at the centre of the university as organisation in a pictorial format. An example Rich Picture is shown below:

The Rich Picture has been described as "*a tool for reasoning about work context*" (Monk & Howard, 1998) and both the technique and the methodology have been applied to educational scenarios by several authors and practitioners (Patel, 1996; Kassabova & Trounson, 2000; Briggs, 2003). A lecture and tutorial are used to introduce examples of Rich Pictures to the students. These examples illustrate a variety of individual

perspectives of how different students see themselves acting and interacting within the context of the university as learning environment. The students then develop an initial Rich Picture of their own (done as a group exercise) and this is developed through discussion, several iterations and feedback into its final form. An example is shown below.

THE FINAL FORMAT – ‘LEARNING AT UNIVERSITY’

The model developed above – the cognitive profile, Rich Pictures and Individual Learning Environment – was introduced as a pre university unit that forms the central unit (300 students) of the university preparation course. The differences between 64 predominantly 3rd year students doing a level 3 unit in ‘Human Computer Interaction’ and 300 pre-university students completing a ‘Learning at University’ unit are significant. However, the first phase went very well and provided additional data and material for consideration in the development of the model as learning system

The research has a practical focus. It was always intended that the research and methodology would provide the basis of several short courses and also longer units if possible. The main target group were first year students and it was hoped that short courses could be provided in the first semester, although it was recognised that the best time could be before commencing university study. A variety of courses, including half-day, 1 day and 1 week courses were designed for students (and staff in one case), but there were difficulties with fitting into the current diet of study skills courses. However, an opportunity did arise with the redevelopment of a series of university preparation units to integrate the material into a keystone unit for a university preparation course. This unit, Learning at University, was aimed at helping students understand their own learning more fully and thus to help provide the individual metacognitive skills and strategies necessary for each student to more fully benefit from the other units comprising the course.

It can be argued that both the methodology and the unit can also be seen as a learning system designed and developed to help the student to develop as an autonomous learner. This is within the context of the different systemic demands of mass higher education (educational and social). In Banathy’s (1999) terms of key entity, key function and organising the education for learning outcomes [i.e. of the learning system], we have the following:

- The key entity is the student
- The key function is to enable autonomous learning
- How to ‘organize the education for attaining the best possible learning outcomes?’ is achieved via the current and proposed implementation of the ‘Learning at University’ unit

Using the techniques of SSM (Checkland & Scholes, 1990), we can define the elements of the systems as shown below. These are followed by a Root Definition, which draws the elements together and a Conceptual Model which presents the minimum subsystems needed to allow the system defined in the Root Definition to function.

Client: The individual student

Actors: The individual student, other students, university staff (academics and administrative)

Transformation: Identification and satisfaction of the individual students need to develop as an autonomous learner in university and life long learning

Worldview: Autonomous learning is a desirable learner attribute in mass higher education and the knowledge society

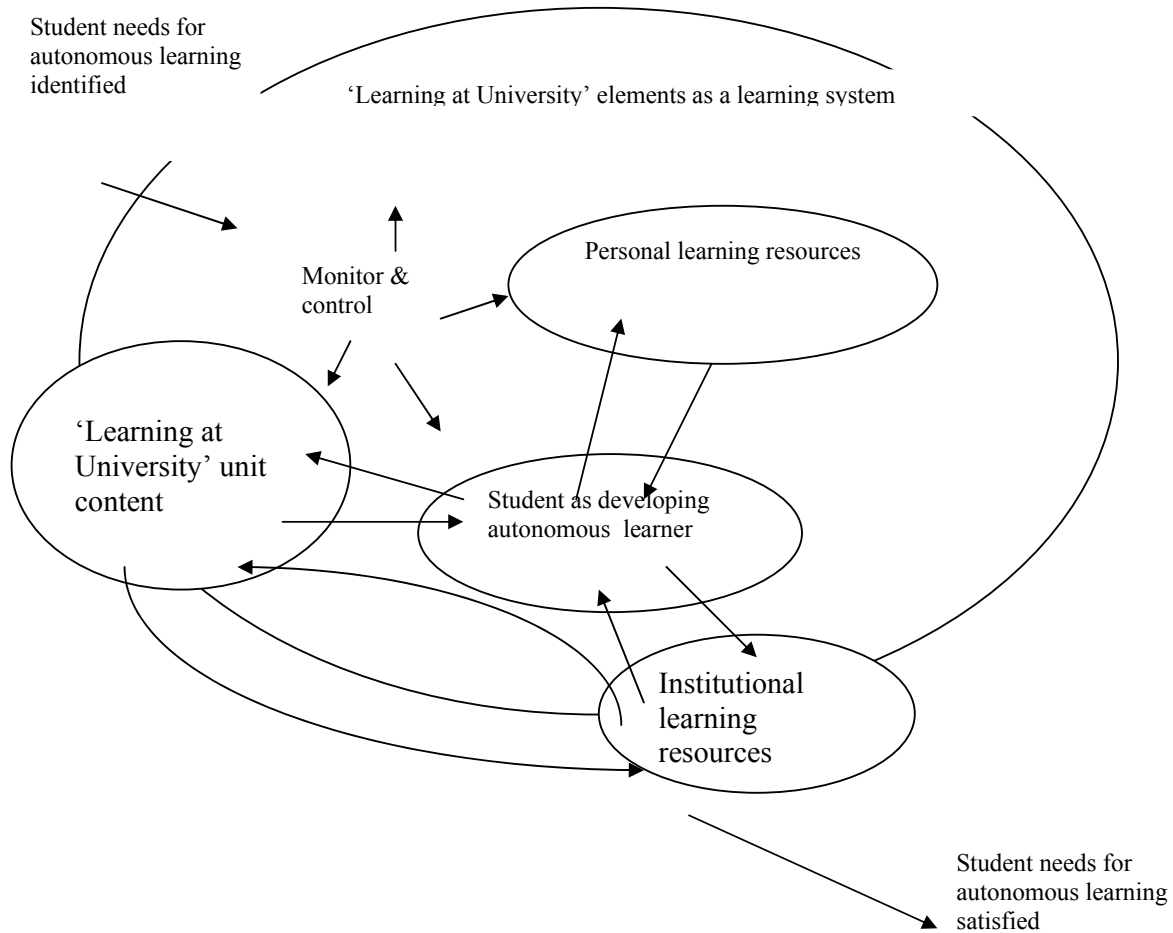
Owner: The university

Environment: Social and educational change, university as learning environment, peer group, work opportunities

Root Definition

The 'Learning at University' unit and associated personnel and resources comprise a system, owned by the university and operated by the student and university staff which identifies and satisfies the individual student's need for autonomous learning capabilities. It operates in an environment enhanced and constrained by the academic and social resources and relationships

Conceptual Model of 'Learning at University' as a learning system



CONCLUSIONS

When considering an approach where the participants are more fully involved in the research process, and that process involves aspects of an assessed unit, one must be aware of several potential pitfalls. Because the work was assessed, it is possible that students might over emphasise the positive aspects of the process in documents such as the reflective journal, ILE documentation and the feed-back survey. To counter this, some cross-checking of comments and opinions is available because of the multiple measures. In addition, the fact that the CSA test was a computer generated test rather than a self-administered questionnaire gave some assurance as to the objectivity of the results.

The results indicated that the ability of each individual to develop a personal learning resource and reflect on the role of their metacognitive characteristics could be a useful instrument in the development of the autonomous life long learner. The student comments and qualitative data suggested that knowledge of and reflection on the characteristics of individual cognitive profiles could also affect the design and content of individual learning environments, albeit in different ways. Several respondents questioned why they had not had access to this type of metacognitive information earlier in their school or university careers. They also suggested that they would have found the knowledge particularly useful for the transition to university life and the greater demands of independent learning.

Responses and comments often showed that participants were aware of the impact of their cognitive and learning styles and personality type on their learning characteristics in a relatively uninformed way. The information provided by the three measures comprising the cognitive profile, allowed them to reflect on their learning related characteristics and preferences in a much more structured and informed manner. The outcome of applying the results of this reflection was enhanced metacognitive skills and knowledge. The design of the Individual Learning Environment was an iterative process which both enabled the reflection and was affected by the user profile in terms of structure and content. Many found that the dimensions of the CSA gave them the most directly useful information in terms of the format and content of the ILE 'look and feel' and interface design. In contrast, the MBTI and ASSIST measures provided personal learning and information preference details which were informative and had greater relevance to the learning process. These details could then be either integrated into the 'look and feel' of the ILE or used more directly to suggest the inclusion of specific learning related features.

Further iterations of the process and methodology have introduced further elements such as the Rich Picture to enable students to consider additional aspects of how they might interface with both online learning environments and the university as learning environment. In this way, the methodology and techniques, as applied in the form of a taught unit, can be seen as a learning system which helps the student to produce a series of interfaces for integrating with learning environments at that same time as aiding the development of the student as an autonomous learner.

There is also a considerable difference between a cohort of 64 second and third year Human Computer Interaction students and larger number of students taking a university preparation course. An initial concern could be the apparently huge difference in the likely skills available to each group in terms of developing the learning environment as website. There is an emphasis throughout the process that this is not a technical or technology based process, but one of reflection and design. The form and content of the environment is given far greater emphasis than the technical 'bells and whistles' that can be added. To this end, the current generation of web development tools such as FrontPage (and even, at a stretch, Word) and their associated tutorials provide initial set of pages which can be developed with relative ease. The collaborative element of learning is often very prominent here, regardless of individual preferences and the experience for different students continues to vary enormously in this area. However, the students in the feedback survey often mention the sense of achievement in having developed a personal learning environment and the associated skills as one of the tangible benefits. Students do develop a personal learning environment and series of interfaces, but the development process is very much enabled by collaborative learning

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Effectiveness of the Life Skills Program for HIV/AIDS prevention in Northern Thai Housewives.

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Abstract

This research applied a Life Skills Program to the health area of HIV/AIDS. Unsafe sexual behaviours and the lack of HIV/AIDS knowledge among many Thai people place them at risk of acquiring HIV and AIDS. Thus, there is a need to construct a Life Skills Program strategy to prevent and reduce high risk behaviour associated with HIV/AIDS. The study targeted housewives between the ages of 15 and 60 years living in urban and rural low-income areas in Nakhon Sawan province, a large city in the south of the Northern region of Thailand.

One hundred housewives participated in the program. Fifty housewives were assigned as the intervention group and fifty housewives were assigned as the control group. The intervention group received the HIV/AIDS prevention intervention using the applied Life Skills Program constructed by the Thai Ministry of Education (MOE) and the Ministry of Public Health (MOPH). The program assessed eight life skills for preventing HIV/AIDS infection with three interventions over a one-month period.

The activities in the intervention were carried out with focus groups, role-plays, training and practice. Data collection involved general knowledge questionnaires, attitude forms using the Health Belief Model to assess sexual behaviours and finally an interview for evaluating high risk sexual behaviours among housewives and their husbands. The data collection was done four times; a pre-test was assessed before the first intervention and three post-tests were assessed at 1 month, 2 months and 8 months later. Each data collection in the control group was done a week later after in the intervention group.

The results showed that knowledge of the intervention group was greater than that of the control group at each follow up and the intervention housewives had a more significant effect on attitude scores to levels beyond those of the control housewives.

Introduction

The extensive spread of HIV appears to have begun in the late 1970s and early 1980s among: men and women with multiple sexual partners in east and central Africa; men having sex with men (MSM) and bisexual men in certain urban areas of the Americas, Australia, and Western Europe. The virus is now prevalent in all countries (UNAIDS, 2000). In mid 1996, UNAIDS and WHO estimated that 27.9 million people worldwide had been infected with HIV from the beginning of the pandemic (UNAIDS, 1996). This had increased to almost 40 million at the end of December 2003 (WHO & UNAIDS, 2003). This included more than 37 million adults and around 2.5 million children less than 15 years of age. More than 95 percent of people infected with HIV are in developing countries, and almost 50 percent of these are women. Three million AIDS deaths were reported in 2003, of which 2.5 million were adults and 500,000 were children under 15 years of age (WHO & UNAIDS, 2003). The World Health Organization (WHO) reported in April 2004 that AIDS has killed more than 25 million people worldwide since the beginning of the epidemic. More than 8,000 people die every day (1 person every 10 seconds) and more than 14 million children who have lost one or both parents to AIDS (WHO Regional Office for South East Asia, 2004). The first case of AIDS in Thailand was reported in 1984 (AVERT, 2004). In a recent report by the Bureau of Epidemiology, Ministry of Public Health, the distribution of reported AIDS cases by age and occupation group since September 1984 to 31 January 2004 is described. More than 26% of cases are between 25-29 years of age, followed by 26% between 30-34 years of age, 16% between 35-39 years, 10% between 20-24 years,

8% between 40-44 years of age and 0.13% between 10-14 years of age. The proportion of males to females is 2.7:1. Approximately 47% are labourers, 21% agricultural workers, 5.6% unemployed, 4.3% shopkeepers%, and others 18.7% (AIDS Division (Thailand Ministry of Public Health), 2004).

The spread of HIV/AIDS infection in Thailand has come in six waves. The first wave involved homosexuals and those who had sex with foreigners (Janjareon and Khamman, 2002). Then, in 1988-1989, the major wave of the epidemic exploded among injecting drug users, with reported infections increasing from almost nil to 40 percent in a single year (AVERT, 2004). The third wave infected prostitutes and sex workers ("Back to No Future", 2000), although AVERT reports that this happened at almost the same time as the second wave (AVERT, 2004). The fourth wave affected sex workers' clients. They, in turn, infected their wives and girlfriends, causing the fifth wave. The sixth wave has affected children ("Back to No Future", 2000).

Thailand is a major centre of the AIDS epidemic and the phenomenon has been linked to Thai women (Finkler, 2002). Thai women are particularly vulnerable to HIV/AIDS infection, because the use of prostitutes by men is condoned in Thai society (Ruangjiratain and Kendall, 1998). Thai men do not generally use condoms, either with their wives for birth control or with commercial sex partners to prevent sexually transmitted diseases (STDs) (VanLandingham, et al., 1997). People between the age of 15-29 years, and especially women, have become infected with HIV mainly through unsafe sex and a lack of AIDS knowledge (Xinhua News Agency, 2003).

Most married women in Thailand are housewives. A housewife is defined in this study as a woman who is married and does home-duties only. In the Thai language she is called '*mae-ban*'. More than a half of Thai housewives are in the low socioeconomic levels of society, have little education and low incomes. Normally men diagnosed as HIV positive will withhold this information and continue to have sex with their wives without protection. This is the major reason for the rapid increase in the number of AIDS cases among housewives in Thailand (Belk, Ostergaard and Groves, 1998). Female oppression also serves to keep Thai women powerless, not only in their ability to stay healthy, but also in their ability to choose their own destiny (Ruangjiratain and Kendall, 1998). Both culturally and politically, Thai women are put at risk of AIDS infection, they have little control over their own sex lives and even less control over their husbands' sexual behaviours (Asia Source, 1999). Moreover, although many women are aware that their husbands visit prostitutes, Thai culture forbids them to talk about this extramarital sexual activity or to persuade their husbands to use condoms (Ruangjiratain and Kendall, 1998).

The motivation for this study was the rapidly increasing rate of HIV/AIDS infection among women in low income and low socio-economic groups and who are reported to be the most susceptible to AIDS (Pitayanon, Kongsin and Janjareon, 1997). Since the HIV/AIDS epidemic, there has been spread of the disease through heterosexual sex. UNAIDS has indicated that the most important risk of STDs and HIV/AIDS among housewives is sex with their husbands or sex partners (UNAIDS, 2001). To date, it is reported that half of the newly identified infections occurring among the wives and sexual partners are caused by men who have been infected for several years (AVERT, 2004). In Thai society, women lack the power to reduce their risk because they are not likely to talk about HIV/AIDS or sex with their husbands, friends or boyfriends. There is a need to change these sexual behaviours and to encourage women to talk confidently with their husbands about sex and HIV/AIDS. With these skills, housewives will be empowered to have more control over prevention for themselves and their families.

It was hypothesised that housewives trained with the Life Skills Program would become more knowledgeable about HIV/AIDS, and have increased positive attitudes to safe sex. The Program requires housewives to consider whether they should change their sexual behaviours and how to do this, if at all. This justifies the focus of this study on housewives in Thailand. It is also essential to verify whether the Life Skills Program is capable of encouraging housewives to change their sexual behaviours and to avoid HIV/AIDS infection and thereby reduce the rate of new HIV/AIDS infections in Thailand.

AIM AND SIGNIFICANCE OF THE STUDY

The overall aim of this study was to evaluate the effectiveness of the Life Skills Program, as developed by the Thai Ministry of Education and the Ministry of Public Health for HIV/AIDS prevention, among housewives in Nakhon Sawan, a large province in the south of Northern Thailand. Although there is evidence that married women are becoming infected by their husbands, HIV/AIDS prevention strategies aimed at married couples have not been systematically implemented (UNAIDS, 1996). HIV/AIDS can be transmitted from pregnant women to their babies in the womb, during birth, or from breastfeeding (AVERT, 1999) and approximately 1.5 percent of HIV cases occur among pregnant women (AIDS Division (Thailand Ministry of Public Health), 2003). Therefore, education and prevention among housewives should be carried out to decrease the HIV/AIDS epidemic among that group and furthermore in households and in the population generally in Thailand.

PURPOSE OF THE STUDY

The purpose of this study was to investigate the effectiveness of the Life Skills Program involving group processes for increasing knowledge and for changing attitudes and risk behaviours with regard to HIV/AIDS infection among Thai housewives in the low income area of Nakhon Sawan province, Thailand. This research was part of a larger study which also examined whether the application of the Health Belief Model within the Thai culture is an appropriate method of predicting health behaviours in Thai people generally.

RESEARCH QUESTIONS

1. Does the Life Skill Program increase housewives' knowledge about HIV/AIDS?
2. Does the Life Skill Program change housewives' attitudes about HIV/AIDS?
3. Are there any differences in HIV/AIDS knowledge between the intervention group and the control group following the Life Skill Program intervention?
4. Are there any differences in attitudes to HIV/AIDS between the intervention group and the control group following the Life Skill Program intervention?

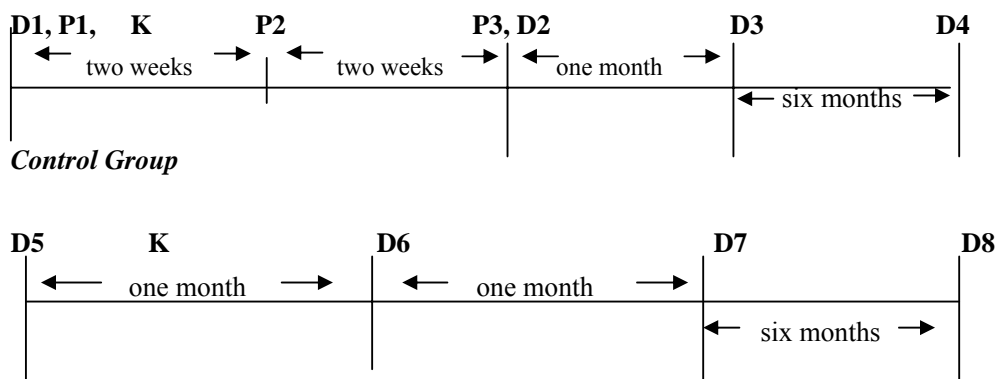
METHODS

Design

A quasi experimental design was employed. We acknowledge the general nature of quasi experimentation, which may compromise population validity via alternative causal factors present in uncontrolled variables outside of the intervention. In this design, systematic selection bias is due to sampling of intact groups from within their naturally formed urban and rural areas. The issue of sampling bias will be the subject of subsequent analysis, but we also argue the need for practical sampling (Henry, 1990) and the emphasis of 'ecological setting validity' (Huck, Cormier and Bounds, 1974) where it is important to sample settings rather than subjects in some contexts. The present analysis was therefore based on a 2 (Group: Intervention; Control) by 4 (Time: Pre-test; Post-test 1; Post-test 2; Post-test 3) repeated measures ANOVA, with repeated measures on the time factor. Separate analyses were performed for the dependent variables Attitude and Knowledge.

The study was conducted in three stages. In the first stage, all participants undertook the pre-test questionnaire and interview to determine the knowledge and attitudes of HIV/AIDS. The second stage involved actual implementation of the Life Skills Program with the intervention group. The third stage involved data collection using three post-test questionnaires. Post-test 1 was assessed immediately after the completion of the three interventions, Post-test 2 was collected one month after Post-test 1; Post-test 3 was undertaken five months after Post-test 2. Each data collection in the control group was done a week later from the intervention group.

Intervention Group



- D1,D5 means Data collection before the first intervention (Pre-test)
- D2,D6 means Data collection after completing three interventions (Post-test 1)
- D3,D7 means Data collection one month after Post-test 1 (Post-test 2)
- D4,D8 means Data collection six months after Post-test 2 (Post-test 3)
- P1 means The first intervention of the Life Skills Program
- P2 means The second intervention of the Life Skills Program
- P3 means The third intervention of the Life Skills Program
- K means pamphlets and brochures of HIV/AIDS knowledge

Figure 1. Display of design including pre-test and follow up testing

The Life Skill Program intervention

Participants in the intervention group received pamphlets and brochures on HIV/AIDS to read and were exposed to the activities of the Life Skill Program for three sessions over a four-week-period; participants in the control group only received pamphlets and brochures on HIV/AIDS. The Life Skills Program for HIV/AIDS prevention in this study was applied and adapted from the program conducted by the Thai Ministries of Education and Public Health. In spite of the program having been applied widely to people in many categories, and with both well-educated and poorly educated people, but it has never been used with low educated women living in slum and low-income areas in Nakhon Sawan province. The intervention activities were undertaken on three occasions, once a fortnight over a four-week period. Each intervention required one day of eight hours. The control group received only HIV/AIDS pamphlets and brochures after the pre-test.

The intervention trained participants with extensive use of group processes including role-plays and discussions. Activities in the program began among the whole group of housewives and then focused on small groups; however, a few activities were set for individuals. Each small group consisted of 5-6 housewives of about the same age to increase openness and frankness in discussion. Approximately 6-8 housewives of different ages were required for role-plays. These focus groups were provided with information on what situations and discussion points were included in the program.

General HIV/AIDS knowledge and information about the infection and transmission was targeted at housewives in the intervention group in one knowledge lesson. Three lessons on attitudes were included in the program: empathy with HIV and AIDS persons; safe and responsible sex awareness; and responsibility about sex difference and sex roles.

Eight life skills adapted for housewives took place during the three-day-intervention. They consisted of three perceived-risk skills, which generated housewives' awareness of the severity of HIV/AIDS infection and the need to protect themselves and their families from getting HIV/AIDS infection. Two

decision-making skills were trained to increase appropriate and safe sexual behaviour. HIV/AIDS communication skills were also trained to encourage their ability for discussion on HIV/AIDS knowledge and information with their husbands and families. The skill of just saying 'No' is not normally used among Thai people, so two refusal skills were included in the training.

Questionnaires

Knowledge

The knowledge questionnaire consisted of 30 factual statements with a common response format that ranged from 'true' through 'not sure' to 'false' to give a fuller picture of HIV/AIDS knowledge levels. A score of 1 was given for each correct answer and 0 for not sure and wrong answers. HIV/AIDS knowledge and information was identified into 5 subjects of general knowledge; transmission routes, misconceptions, safe and sexual behaviour and HIV testing. For example, 'AIDS is caused by a virus', 'HIV is not present in saliva, tears or urine', 'A pregnant woman can transmit HIV to her baby in the womb or by breastfeeding', 'Using condoms can reduce the risk of getting HIV/AIDS' and 'There are new medicines that might help to treat HIV/AIDS'.

Attitudes

The attitude questionnaire was based on the Health Belief Model. Housewives were asked eight beliefs of perceived susceptibility, five beliefs of perceived severity, five beliefs of perceived benefits and six beliefs of perceived barriers to changing their behaviour. Examples are: 'It is a tradition of Thai men to have sex with prostitutes to prove their virility' (perceived susceptibility), 'Condom use is an effective prevention only for birth control not for HIV/AIDS (perceived severity)', 'Refuse to have sex with men/women who have many sexual partners' (perceived benefits) and 'It would be my embarrassing if I did all things I have to do to protect myself from getting HIV/AIDS infection.' (perceived barriers). Items for each beliefs set were rated on a 5 point Likert scale (strongly agree to strongly disagree) and the total scores for each belief set were combined to form the overall attitude score.

Sample

This study focused specially on housewives between the age of 15 and 60 years in urban slum areas and rural low-income areas in Nakhon Sawan province, in northern Thailand. The sample of 100 housewives was selected by the Health Promotion Centre Region 8 and the Nakhon Sawan City Municipality Health Centre, with the assistance of the leaders of the housewife groups in each area, both in urban and rural areas. Participants were selected from two districts; the first district was in an urban area and the second in a rural area. Participants were selected on the following criteria: being in 15-60 years of age, location, power and efficiency of the head of districts to motivate them to join the research until the end of the program.

The comparative country (intervention) and city (control) samples provided some differences in the demographics of the intervention (n = 50) and control (n = 50) group. The modal age bracket of the intervention group was between 30-39 years, lower than the control group mode of 40-49 years. The modal level of education category for both groups was primary school (70% and 84% respectively), but the frequency of secondary education was higher for the intervention group (30%) than for the control group (8%). For both groups, the modal income categories were 2000-3000 baht (62% and 56% for the intervention and control groups respectively) followed by 1000-2000 baht (32% and 22%). There was a greater spread of incomes levels for the control group, including the 'unfirm' (19%) and 'more than 4000 baht' (12%) categories. Those in the control group had been married longer (mode = 16-20 years, 36%) than those in the intervention group (mode = 6-10 years, 30%). (This no doubt reflects the older age categories represented in the control group.) There were no differences between the groups in terms of number of children, with 'two children' the mode for both. Also, there were no differences in husband's occupation with the modal category labourer for both groups (66% and 78% respectively). In the intervention group, however, more husbands were farmers than in the control group (28% and 2% respectively). For the control group, there were more sellers and other occupations (2% and 16% respectively).

DATA ANALYSIS

Attitudes

Table 1 below shows the mean attitude scores across the two groups from pre test to the 8 month post test.

Table 1. Mean attitude scores across the two groups at each follow up.

GROUP		TIME			
		Pre-Test	1 month	2 months	8 months
Intervention	Mean	76.240	97.920	98.120	94.160
	Std. Error	1.241	1.088	1.153	1.257
Control	Mean	77.420	83.340	83.420	85.000
	Std. Error	1.241	1.088	1.153	1.257

There were significant main effects for Time, $F(1, 98) = 126.71, p < .001$ and Group, $F(1, 98) = 52.88, p < .001$. However, these were superseded by the significant interaction effect, $F(1, 98) = 20.94, p < .001$, illustrated in Figure 2 below.

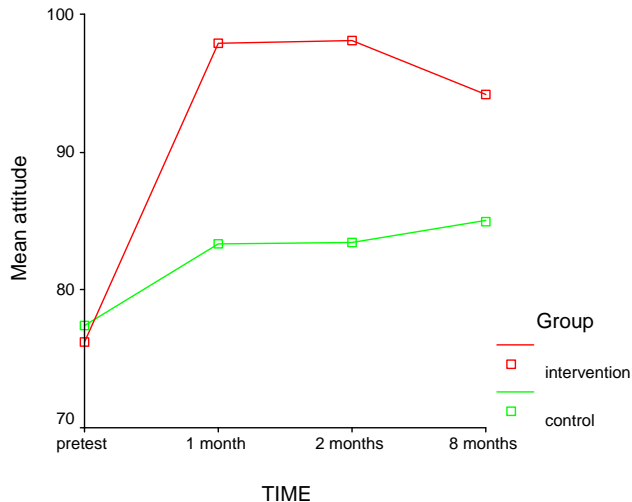


Figure 2. Interaction between group and time for attitude scores

Post hoc analysis (single degree of freedom univariate F tests) showed no group differences in pre-test attitude scores. However, the attitude scores of the intervention group were significantly higher than the control group at each of the post tests; at one month post intervention (respective means = 97.92; 83.34), $F(1, 98) = 89.75$, $p < .001$; two months post (means = 98.12; 83.42), $F(1,98) = 81.33$, $p < .001$; and at eight months (means = 94.16; 85.00), $F(1,98) = 26.54$, $p < .001$. Post hoc contrasts also showed that for the intervention group all post test attitude scores were significantly different from the pre test score ($p < .001$). Interestingly, the same was true for the control group with scores relatively higher than the pre test at each follow up ($p < .001$). Thus, some Hawthorne effects from their participation in the study were evident for the control group. Also, for the intervention group, there was a significant decline in attitude from post test 1 scores (1 month) when compared with post test 3 (8 months) – though their attitude scores remained higher than the control group at all times.

Knowledge

Table 2 below shows the mean knowledge scores across the two groups from pre test to the 8 month post test.

Table 2. Mean knowledge scores across the two groups at each follow up.

Measure: MEASURE_1		TIME			
GROUP		Pre Test	1 month	2 months	8 months
intervention	Mean	14.160	22.420	21.720	20.080
	Std. Error	.477	.540	.589	.547
control	Mean	13.300	15.260	13.080	14.540
	Std. Error	.477	.540	.589	.547

There were significant main effects for Time, $F(1, 98) = 43.77$, $p < .001$ and Group, $F(1, 98) = 98.66$, $p < .001$. However these were superseded by the significant interaction effect, $F(1, 98) = 30.47$, $p < .001$, illustrated in Figure 3 below.

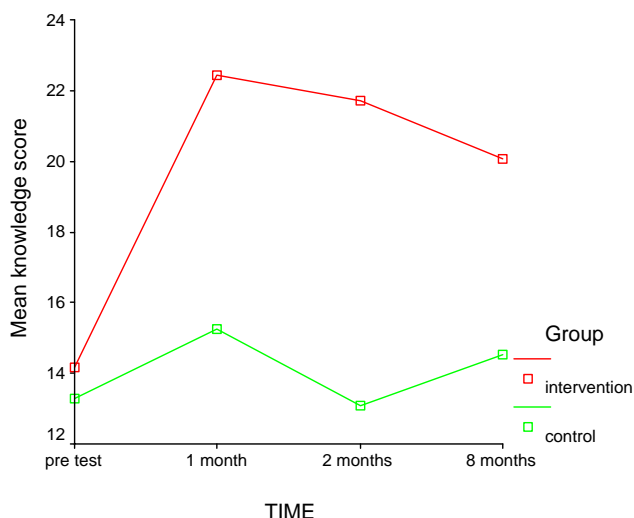


Figure 3. Interaction between group and time for knowledge scores

Post hoc analysis (single degree of freedom univariate F tests) showed no group differences in pre test knowledge scores. The knowledge scores of the intervention group were significantly higher than the control group, however, at each of the post tests; at one month post intervention (respective means = 22.42, 15.26), $F(1, 98) = 87.54, p < .001$; two months post (means = 21.72, 13.08), $F(1, 98) = 107.72, p < .001$; and at eight months (means = 20.08, 14.54), $F(1, 98) = 51.22, p < .001$.

Post hoc contrasts also showed that for the intervention group all knowledge scores were significantly different from the pre-test score ($p < .001$). However, while scores remained at levels higher than the pre-test they did show a declining pattern across time with a significant decrease in knowledge from post test 1 to post test 2 ($p < .05$) and from post test 2 to post test 3 ($p < .001$). For the control group, knowledge scores were significantly higher than the pre test scores at the first post test (1 month only). The initial increase in knowledge at post test 1 declined at post test 2 ($p < .05$) and was somewhat restored to the first post test level at post test 3 ($p < .05$). Nevertheless, knowledge at the final post test had not improved past the initial baseline pre test levels ($p > .05$).

Conclusions

The intervention had a significant effect on attitudes elevating the intervention groups' attitude scores beyond their pre-test levels and to levels beyond those of the control group at each post test follow. However these improved attitudes began to decline at the 8 month follow up. The findings suggest a clear impact of the Life Skills Program and encourage the implementations of such programs for increasing attitudes to safe sex and future research on the long term impact of these programs. There also was a slight effect on attitudes of the control group following the modified intervention. This finding demonstrates the utility of promoting safer sex with even this small attention to the topic of safer sex provided to the control group having a general halo effect on reported attitudes of control group participants.

The pattern for knowledge showed that knowledge of the intervention group was greater than that of the control group at each follow up and shows a significant impact of the intervention. However, knowledge levels for the intervention group were in decline at each follow up, suggesting that the persistence of the intervention may be limited and that follow-up interventions would be useful in maintaining high levels of knowledge. The control group had improved knowledge at the first post test (1 month follow up) but these levels fluctuated randomly over the follow up time period.

Future research and analysis will focus on adjustments and controls for selection biases, based on the geographical sampling of participants within regions, and will identify behavioural changes that can accompany changes in knowledge and attitudes. The present findings support the need for this further analysis and for future development and evaluation of HIV/AIDS programs aimed at developing knowledge and positive attitudes towards safe sex behaviour among females in Thailand.

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Wipawin, N. Sripatum University, Thailand. Students' Response to New Learning Technologies in Thailand

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Introduction

New teaching and learning technologies are providing added opportunities for learners to enhance their capabilities not only within the walls of a school but outside the classroom and year round. The integration of modern electronic and telecommunication technology with education is bringing about an impressive impact on the learning process proving that it no longer needs to be confined within the classroom. It is now possible to search for information from one's office or home from thousands of databases around the world. New learning technology is seen as bringing improved learning opportunities to a larger number of students than previously possible.

As new learning and teaching technologies become more advanced and popular, questions arise as to whether the role of teachers or live instructors will be replaced by new technologies. History shows that the creation of printed books when Gutenberg invented the movable type for the printing press, Thomas Edison's invention of the film projector and the satellite television broadcasts did not replace classroom instruction. Instructors are becoming aware that in this era they need to take a new role to become better by using technology effectively.

New learning technologies in Thailand.

1. How do students learn?

Teaching and learning are still in the form of presentations and explanations which require students to have the right information, clear understanding, and committed to memory in order to be utilized. In the cognitive learning theory, they can apply three critical areas for better learning such as: attention, information processing and memory. The presentations and explanations can be in written form and other media. The media including distance learning technologies can be designed and delivered to learning in any form. The need to evaluate students' understanding is the main focus of applying new learning technologies to see if it can improve the student's capabilities and performance. From the Information-Processing Model, information comes in through any of the five senses (sight, hearing, touch, smell, and taste) and impinges on a sensory register. Filters are activated to screen out what a person will pay attention to based on interest. The main features of the information are analyzed, abstracted, and encoded.

If any typical classroom instruction or new learning technologies create students who can possess the ability to think clearly and creatively, these are achievements in the learning process. We need to build up students who can generate new ideas, invent new products, devise new services and suggest quality improvements. Teachers must work hard for these objectives.

Teaching methodology in Thailand has been continuously developed according to the progress of information technology such as lecture with the LCD projector, the powerpoint display, the video and the Internet. There are online courses and websites in many subject areas.

2. The components of new learning technologies in Thailand.

Learning Technology is defined as the application of technology for the enhancement of teaching, learning and assessment. Learning Technology includes computer-based learning and multimedia materials and the use of networks and communications systems to support learning.

Buren(2001:34) reports that multimedia technology is favoured in teaching presentations such as CD-ROM and Internet. There are two types of learning technologies such as;

1. Presentation method/ Explanation

1.1.Content

- Content on text such as textbook, handout, whiteboard, LCD.
- Content on media such as CD-ROM, Video, VCD, Television, Radio, PowerPoint display.
- Content on the Internet such as websites, e-learning, online courses, e-journal, e-book, online database

1.2. Teacher / Instructor / Supervisor / Instructional designer

- Lecture (Face to face)
- Consult via e-mail, web board, telephone, by post
- Video conferencing
- Tutorial online

2. Distribution method

2.1 Communication technology / Network Infrastructure

- Computer network (LAN or WAN), the Internet
- Satellite broadcast television, radio transmission
- Education system network
- Correspondence study

2.2. Learner

- Students in the classroom
- Students in distance learning system
- Staff in the workplace

Besides distance learning system such as learning via television or radio, e-learning is one of the learning technologies utilizing features and resources in the Internet to form the knowledge-supporting environment. E-learning designers and instructors have to consider the Internet capabilities and its various services. For example, learners use e-mail or chat rooms to interact with the teachers and other learners. The basic principles to set up e-learning are as follows: (Charmonman 2002)

1. Facilitate communication between instructors and learners. Communication between instructors and learners is an important part for enhancing enthusiasm in both teaching and learning. Facilitating communication means that the teacher and the learner can communicate with each other at any time and all the time.
2. Develop cooperation among learners. Cooperation among learners can help to develop idea and understanding more effectively than learning by oneself. The cooperation creates group relationship which lead to exchanging and accepting of each other idea.
3. Encourage learners to seek for knowledge by themselves. Self-seeking knowledge makes learners more enthusiastic to learn and prevent them from depending on teachers' answers.
4. Provide immediate feedback. With immediate feedback in e-learning, learners can promptly recognize their abilities and adjust their learning methods and learning behaviors.
5. Support unlimited learning and teaching. Anyone interested in education has a chance to learn because it can be done at any time and at anyplace.

3. Computer Literacy, Information Literacy in higher education in Thailand

Thai Social/Scientific Academic and Research Network (ThaiSARN) (<http://www.thaisarn.net.th/>) is one of the project of National Electronics and Computer Technology Center (NECTEC) (<http://www.nectec.or.th/>) to promote the use of Internet in Thailand. At present, ThaiSARN-3 is currently connected to three major international research networks: Scientific Information Network (SINET) of Japan; Asia Pacific Advanced Network (APAN); and Internet-2.

Ministry of education also has a plan to link the projects such as ThaiSARN, UniNet, SchoolNet and MOENet (Ministry of education) to become the National Education Network (EdNet) to increase the number of computer literate and information literate in Thai modern society. According to the SchoolNet Project (<http://school.net.th/thaischool>) in 2003 there are about 4,794 schools online, 1,485 schools which have homepages. The statistics are expected to increase. The curriculum of Thai

universities include in their subjects, knowledge of computer and information technology. All university libraries provide Internet services to their students.

As is to be expected, all Thai universities have their own homepages such as in 137 higher education institutions under the ministry of education (24 public universities, 58 private universities, 41 Ratchabhat Universities and others). There are more than 118 courses of study in higher education in Thailand such as: 18 PhD curriculum, 45 Master's degree curriculum, 46 undergraduate curriculum and 9 certificate curriculum.

Moreover, ICT and e-learning have been introduced in Thailand. Most government and private institutions have been using IT and the Internet. All universities are offering IT- related formal degree programs. Many universities, government agencies, and private sector organizations have been using distance education, starting from the correspondence study, multimedia, telelearning, web-based learning, and the Internet distance education or e-learning.

The websites that identify the progress of e-learning in Thailand such as:

www.mua.go.th/university.htm

www.thai2learn.com

www.learn.in.th

www.onlinetraining.in.th

www.nectec.or.th/courseware/links/e-learning.html

www.sme2.learn.com

www.school.net.th

www.dlf.ac.th

www.chulaonline.com

www.vchakarn.com

www.spu.ac.th

www.rajabkat.ac.th/learning.htm

www.ru.ac.th/e-learning/index_home.html

4. Research findings on new learning technologies in Thailand.

Over the past six years(1998-2003), more and more theses in Thailand mostly in Master degree level related to new learning technologies.(Figure 1). In 1996-2000, at least seven theses findings revealed that the undergraduate and graduate students utilized academic databases from the CD-ROM which provided by libraries for the purposes of report writing and theses work. In 1998-2003, more than 20 thesis revealed that the services of Internet use are World Wide Web and electronic mail; the frequency of the Internet use is every week. The popularity of the Internet is wellknown among Thai students, for example, the thesis findings by Nontakumjan(1999) revealed that 94.37% of engineering students of Chulalongkorn University had experiences in searching information from the Internet. Also, the theses findings in 2003 revealed that 97.2% of Srinakarinwirote University students had experiences in using the Internet(Thongmark 2003), and also 95.7% of Khon Kaen University students use the Internet (Poomee 2001)

In the thesis findings of Khunsanong(2003) it was identified that 78.4% of Burapha University lecturers and researchers use electronic journals, most of them are lecturers in Science and technological subjects. The statistics of users of ThaiLIS databases under the UniNet project (24 public universities) showed that, from January-June 2004, the example of users of Proquest Digital Dissertation Database is 14,822 times, therefore the average is 2,470 times per month.

Although there is an increasing demand for the use of Internet, we still face the same problem in using the Internet. The research findings from 1998-2003 revealed there were an insufficient number of computers available within the campus and faced with the problem of low speed connections among members of the networks. Due to this problem, the thesis findings of Amornsini (2001) found that 70% of students in Mahasarakam province preferred using computers in the Internet shops because of the convenience and the ease of use, while most students in the State Universities in Bangkok metropolis identified using their own computers (Karaveg 2001)

In 2003, there are 6 million active Internet users in Thailand(NECTEC 2003) and the increasing number of 8.42 million Internet Users in 2004(Worldwide Internet Population 2004), while the Thai population is about 64 million people. These findings obtained from the national statistics of computers in Thailand which show an increase in the number of computers acquired each year, reflect the government's policy and support for the use of new teaching-learning technology. However, in terms of computers analyzed according to Thailand's population in 2001-for every 100 households there are only 5.7 computers and only 5.6 persons with access to Internet.(The number of computers has increased to 9.6 in 2003)(National Statistics Office Thailand 2004) Students have use of computers in the library, the computer lab and other facilities within the campus. Some students are able to access the Internet at home as shown by the ISP statistics. There is also an increasing number of customers of high-speed Internet nowadays.

Figure 1: Number of theses in Thailand related to learning technologies(Thai Thesis Database, 2003)

Year	Library websites/ online database	CD- ROM	CAI/WBI/ e-learning	Internet/WWW
2003	3			5
2002	4	1	9	27
2001	1	2	22	46
2000	1	5	7	26
1999	1	4	5	21
1998	2	5	3	24
Total	12	17	46	149

5. Some figures from the research entitled, “Information Use and Needs of Undergraduate Students in Public and Private Universities in Bangkok”, by

Wipawin(2004) was conducted to investigate the current status of information usage and requirement of undergraduate students in Bangkok. The sampling used 1,995 undergraduate students from Public and Private Universities in Bangkok. Data Collection tools consisted of questionnaires sent to 1,195 users with 1,103 (92.30%) response. The findings were as follows: Most students learned how to access library resources and information by themselves, Most students used printed materials and non-print materials on the average level. The printed materials used most were the Thai daily newspapers and Thai textbooks. The electronic media used most included search engine websites, electronic mail and the university website. Finally most students preferred to use the Internet in the Library, consequently the equipment needed most in the library were computers.

Figure 2 showed that information needs in Video(movie and music) was in the high level, while most electronic media were needed by most students(Figure 3). Figure 4,5,6 also showed that information use and needs of Thai students mostly are the Internet service, search engines and computers.

Figure 2: Information Use and Needs in A.V.

Audio Visual Materials	Information Use			Information Needs		
	\bar{X}	S.D.	Level	\bar{X}	S.D.	Level
Video (Academic)	2.85	1.10	Moderate	3.45	1.12	Moderate
Video (Movie and Music)	3.08	1.17	Moderate	3.61	1.11	High
Tape Cassette	2.76	1.13	Moderate	3.32	1.17	Moderate
Microform	2.50	1.15	Moderate	3.17	1.23	Moderate
Slides	2.62	1.18	Moderate	3.23	1.23	Moderate

Figure 3: Information Use and Needs in Electronic media

Electronic media	Information Use			Information Needs		
	X—	S.D.	Level	X—	S.D.	Level
e-journal	2.89	1.16	Moderate	3.55	1.14	High
e-book	2.88	1.16	Moderate	3.58	1.13	High
CD-ROM database	2.94	1.18	Moderate	3.59	1.13	High
e-learning	2.90	1.19	Moderate	3.66	1.15	High
Online database						
-ERIC	2.87	1.17	Moderate	3.58	1.16	High
-DAO	2.68	1.18	Moderate	3.46	1.18	Moderate
-ABI/INFORM	2.68	1.18	Moderate	3.41	1.21	Moderate
-IEEE	2.63	1.25	Moderate	3.30	1.32	Moderate
Thai Thesis database	2.97	1.14	Moderate	3.62	1.11	High
Library websites	3.36	1.07	Moderate	3.87	1.01	High
University websites	3.63	1.01	High	4.01	.96	High
Search engine	3.93	1.03	High	4.28	.90	High
Government organization websites	3.16	1.03	Moderate	3.70	1.03	High
Private organization websites	3.29	1.02	Moderate	3.79	.99	High
E-mail	3.69	1.16	High	4.15	1.00	High

Figure 4: Information Use and Needs of Information services

Information Services	Information Use		Information Needs		t	P-value
	X—	S.D.	X—	S.D.		
Circulation service	3.79	1.04	4.17	.92	-15.259	.000
Interlibrary loan	3.11	1.28	3.69	1.16	-19.221	.000
Help desk	3.08	1.16	3.63	1.14	-19.025	.000
Reference service	3.29	1.08	3.84	1.01	-19.342	.000
Database searching	3.44	1.02	3.93	.97	-18.850	.000
Photocopy service	3.74	1.04	4.13	.91	-14.450	.000
Internet service	3.95	1.05	4.40	.85	-16.377	.000

Figure 5 : Information Use and Needs of Information searching

Information searching	Information Use		Information needs		t	P-value
	X—	S.D.	X—	S.D.		
OPAC(Online Public Access Catalog)	3.21	1.15	3.74	1.10	-19.440	.000
Card catalog	2.72	1.12	3.17	1.25	-15.816	.000
Search engine	3.72	1.07	4.14	.98	-16.457	.000
New book lists	3.25	1.12	3.82	1.03	-20.315	.000
Browse from book shelf	3.38	1.09	3.60	1.17	-7.307	.000
By Library staff/ librarian	3.83	1.10	3.30	1.31	-17.116	.000

Figure 6:Information Use and Needs of Space and facilities.

Space and facilities	Information Use		Information needs		t	P-value
	X	S.D.	X	S.D.		
Computers	3.83	1.10	4.41	.85	-19.141	.000
Study Carrels	3.73	1.09	4.29	.85	-18.618	.000
Study tables	3.72	1.03	4.13	.93	-15.110	.000
Sofa /Chairs	3.23	1.16	3.86	1.04	-20.035	.000
Reading room	3.51	1.07	4.07	.93	-18.705	.000
Reference room	3.11	1.13	3.72	1.05	-20.77	.000
Journal/ newspaper room	3.33	1.10	3.93	.99	-19.777	.000
AV room	3.13	1.22	3.87	1.09	-22.897	.000
Internet room	3.72	1.19	4.38	.89	-19.451	.000
Common room	3.06	1.38	3.88	1.19	-21.407	.000
Coffee/ Snack room	2.90	1.41	3.72	1.25	-21.020	.000
Photocopy corner	3.57	1.15	4.17	.93	-19.800	.000
Exhibition corner	2.99	1.13	3.63	1.10	-20.402	.000

Summary

Students' response to new learning technologies is very positive, at the same time, they still need other media in printed form such as textbooks in Thai, newspapers and magazines. To meet and discuss with lecturers are still vital to the learning process here in Thailand. E-learning is just part of the educational program. If online databases, e-journals and e-books are to be popular among Thai students, they need to understand the English language, otherwise the contents must be in the Thai language. New technologies make teaching and learning easier, faster and more effective when we know how to use new technology wisely, the learning process of Thai students will be moving in a positive direction.

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Wongchachom, C and Chirathamjaree, C . Edith Cowan University, Australia. Exploring Community Empowerment in the Northeast of Thailand: A Study of a Community Information Database System

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ABSTRACT

In addition to the four basic needs of enough food, suitable clothing, adequate medicine and comfortable dwellings, information has now become the fifth basic need. In the information age, people must have adequate knowledge to earn their living and have suitable development. This research explores community empowerment through information. The paper investigates the information needs and local knowledge of the community. A model for a community information database system (CIDS) for rural community development in Thailand is proposed. This will empower local communities to involve themselves and to seek more new knowledge, and thus able to deal effectively with their own problems and their own sustainable development. Through collaboration with one of the key player, the Rajabhat University, it will be responsible for the administration and management of the database system, as part of its information technology service system, which includes the computer center, the office of academic services, and the academic service unit to the community. The study involves some selected communities of Inpeng Community Network (ICN). This consists of 800 communities from 84 sub-districts in 4 provinces in the Northeast of Thailand, namely, Sakon Nakhon, Kalasin, Mukdaharn and Udonrthani. In addition to direct benefits to the ICN, the CIDS will benefit the Rajabhat University and other educational institutions in determining new curriculum based on the community information needs.

Keywords: *Community Information Database System (CIDS), Community Learning Centre, Information Needs, Information Retrieval, Local Knowledge, Community Empowerment, Inpeng Community Network.*

INTRODUCTION

The new millennium is the millennium of the “information society,” where the economy is ‘knowledge-based’ and the main driving technology is Information Communication Technology (ICT). The technology has changed the way we lead our lives from the way we work, the way we learn, to the way we live at an unprecedented speed (Tangkitvanich 1999). In developing countries and the world’s rural regions, technology has increased the information needs of people relative to their previous patterns of information use. Considerable preparation and some specialization are thus required to deal with the complexities introduced by the technology. The relationship between the need for information and the complexity of modern civilization is even more dramatically illustrated by the technology of medicine and transportation; anyone who has encountered an occasion requiring assistance with automobile repairs or a medical problem has been faced with this problem. Not only do we need more information to cope with more complex problems, but also to take advantage of new leisure, entertainment, and cultural activities made available to us by these technologies (Kochen and Donohue 1976). Viewed as information being a basic human need, information can also be considered as the power tool of the information age (Haywood 1995). Information is thus a product to treasure highly, not only for economic reasons but also for achieving quality in the social, cultural, and political life that developing countries strive for (Sweeney 1982).

In the past Thai rural communities have lived adequately based on four basic needs of enough food, suitable clothing, adequate medicine and comfortable dwellings. However, the development of information technology has caused changes to life in rural and urban society, often causing disruptive social and economic changes. In this context information can be used to span the gap between resources and needs. If people in communities know where to turn to, they can be aided in making the needed connections between the resources and their needs.

Information has thus become the fifth basic need (Figure 1). In the information age, people must have adequate knowledge to earn their living and have suitable development. The effectiveness with which information is generated and communicated determines the rate of progress of a society and the fulfillment of its people. So an information database system that can serve the information needs of the community is essential (Ginman 1990). To help a community develop and keep up with the rapid changes of globalization, an understanding of information in society will help it adjust to its social consequences (cited in Martin 1988). Each community has its body of knowledge and its own local intelligence, which have enabled it to survive and prosper (Dordick and Wang 1993).

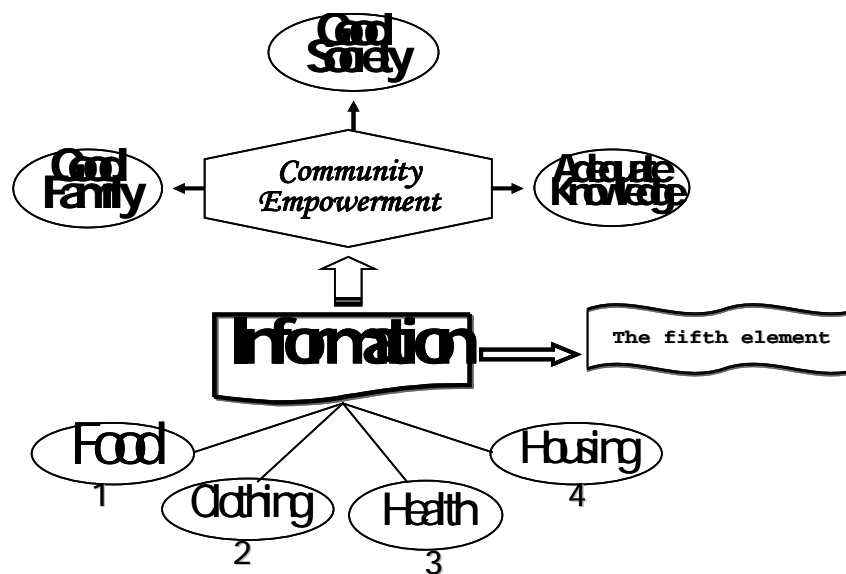


Figure 1: Quality of Life and the Information System

INFORMATION NEEDS AND COMMUNITY INFORMATION NEEDS

There is much research available on community information needs and information theory. The most relevant to this study are “Maslow’s hierarchy of Needs and Information” and “Gibson’s Community Information Needs” (Maslow 2001). According to Maslow, people are not controlled by mechanical forces (the stimuli and reinforcement forces of behaviourism) or unconscious instinctual impulses of psychoanalysis alone. Maslow instead focused on human potential, believing that humans strive to reach the highest levels of their capabilities. He set up a hierarchical theory of needs in which all the basic needs are at the bottom, and the needs concerned with highest potential are at the top. This hierarchical theory is often represented as a pyramid (Figure 2), with the larger, lower levels representing basic needs, and the upper point representing the need for self-actualization. Each level of the pyramid is dependent on the previous level. For example, a person does not fulfil the second need of self-actualisation until the demands for the first have been satisfied.

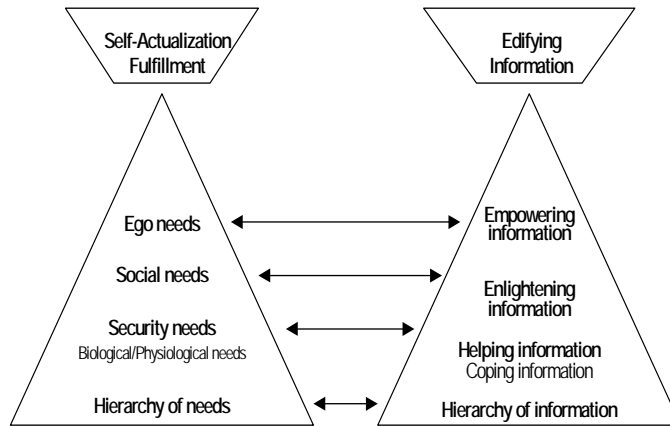


Figure 2: Maslow's Hierarchy of Needs and Information (Maslow 2001)

Ginger Gibson (Gibson 2001) has reviewed community information needs in the mining life cycle. His report lists factors that affect community participation in making informed decisions about mining activities. Communities are often seen by mining executives as the least important audience and they do not consult with or provide information to community members. However, it is this group who is most affected by mining operations. Impacts include increases in cost of living and taxation, and outsiders moving into the community.

COMMUNITY EMPOWERMENT AND COMMUNITY DEVELOPMENT

In 1997, UNESCO (United Nation Education, Social and Cultural Organization) Bangkok (United Nations 1999b) submitted its final report on literacy as a tool for the empowerment of the poor. This report defines empowerment in general terms, as the process that enables human individuals to develop the capacities needed to take control of their lives, to take action to overcome oppression and to realize their full human potential.

The report states that the process of empowerment is a long and complex one. It involves building awareness of the situations/conditions requiring critical review of the situations pertaining to causes and effects; critical thinking about human capacities so that people realize they can do something to improve their situation; the development of skills, capacities and others human potentials; the acquisition of acquiring technical expertise and external assistance; and finally becoming self-dependent or self-reliant. Schematically, the empowerment process may be depicted as shown in Figure 3. Apart from developing appropriate knowledge, skills and attitudes, individuals also need enabling of external conditions of resources and opportunities for their empowerment. Specifically, they need support in terms of capital (funding/loans), resources, equipment, facilities and literacy.

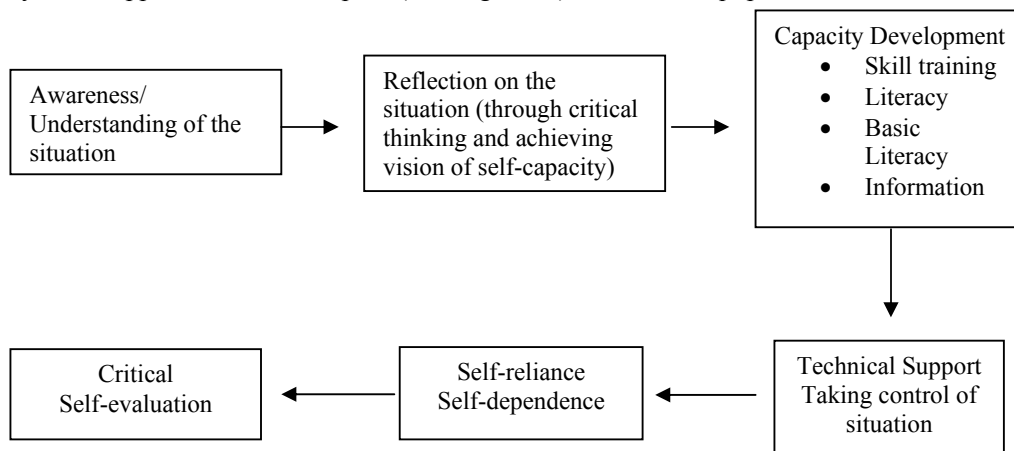


Figure 3: The Empowerment Process (United Nations, 1999b)

In 1997, the Asian Economic Crisis had a tremendous effect on development issues throughout the Asia-Pacific region, including Thailand. The obvious negative economic effects have, however, overshadowed the social impact of the crisis. As a result, the Thai government has proposed a policy framework and strategy to empower communities to respond to present economic situation, and to prepare them to be better able to respond to new crises in the future. Consequently the Community Empowerment for Response to Crisis Action Plan (CERCAP) was formulated to support local communities which undertake proactive crisis-responsive initiatives (United Nations 1999a).

Similarly, in the United States, Jafar (1998) provided a more refined understanding of the concept of community empowerment. Jafar's aim was to illuminate the processes needed to transform community empowerment from a complex theoretical construct into a quantifiable and practical development concept. Community empowerment was seen as the implicit and explicit objectives of interventions designed to enhance development at the community level. This research focused on developing a comprehensive framework to assess the impact of community-based development interventions. To gauge community empowerment, a methodology was designed to provide both subjective and objective measures of the concept. Jafar argued that there was a direct relationship between both measures, as socio-economic development factors significantly influenced the extent to which residents perceived the degree of empowerment of their community. The research also established the multivariate nature of community empowerment, by identifying community management, community participation, and a sense of community as three principal components of the concept. Additionally, the research analysed the effect of the residents' gender and age on the overall perception of empowerment and showed that, although gender and age in general did not directly influence perceived community empowerment, socio-economic factors combined with age and gender did influence these perceptions. Based on the results of this study, certain indicators of social and economic development variables are seen as the most significant determinants of perceived community empowerment and its components. Thomas (1998) also did a similar study through a community computer network.

INFORMATION MODEL AND COMMUNITY INFORMATION DATABASE SYSTEM

Rowlatt et al. (1998) described the SEAMLESS project in the United Kingdom. This two year research project, funded by the British Library, aimed to develop a new model for citizens' information facilitating electronic communication between information providers and customers. The SEAMLESS project enabled co-operation between various information providers, the design and implementation of common standards for data transfer between different systems, and finally facilitated communication between all users, including the end users, i.e. the customers. The SEAMLESS project has had considerable impact on local, national and regional levels and the teams are working with significantly more organizations than originally envisaged, thus demonstrating the need and viability of an information technology model to assist in community empowerment.

In Western Australia an information database system (Infolink), shown in Figure 4, has been initiated by the Western Australian government and community organizations. The purpose of the database is to provide referral to other organizations that may satisfy the particular information needs of clients.



Figure 4: The Infolink Database (The library & Information Services of Western Australia 2001)

In the United States, O’Leary(2000) describes an information model for community information, NorthStarNet (NSN) (Figure 5). This Community Information service model has transformed the local library into a twenty four hour regional information resource for the 1.6 million populations. NSN started in 1995 with four local libraries.



Figure 5: The NorthStarNet: A Model for Community Information (O’Leary 2000)

COMMUNITY INFORMATION DATABASE SYSTEM (CIDS) ARCHITECTURE

The Community Information Database System (CIDS) is a model or prototype of a community information database system for this research. Development of the system is made following the examples of the database systems already established in Australia and USA.

Figure 6 below shows the relationship between the community information database system and the mission and responsibility of the Rajabhat University, a higher education institution for community development.

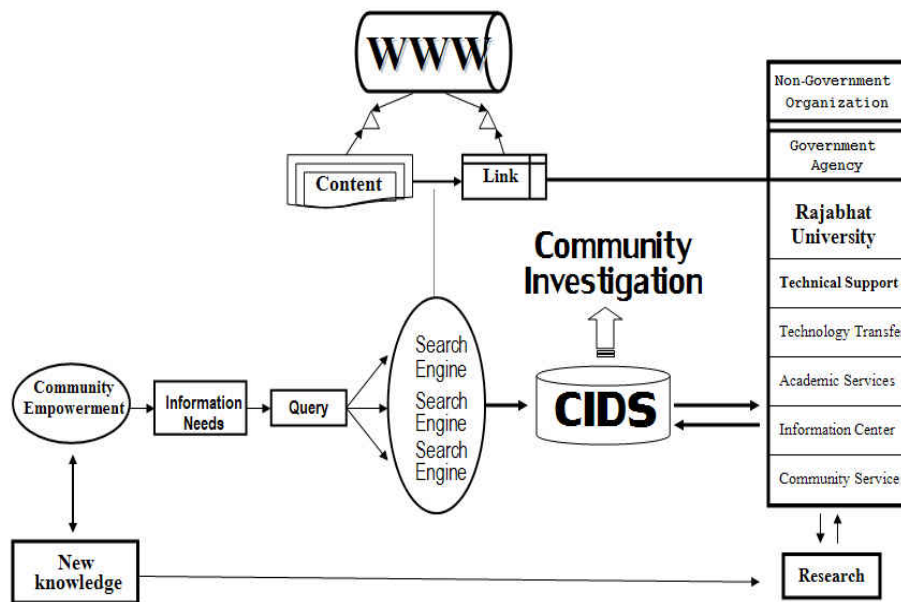


Figure 6: The Community Information Database System (CIDS) Architecture

CIDS, the Community Information Database System, will be under the academic service system of the Rajabhat University. The Rajabhat University will be responsible for the administration and management of the database system, as part of its information technology service system, which includes the computer center, the office of academic services, and the academic service unit to the community. According to article 7 of Rajabhat University Act (Rajabhat University Council 2004), the Rajabhat University's objectives for local development are to provide tertiary and high level vocational education, to conduct research as an academic service to the general public, to improve, transfer and develop technology, to preserve and promote arts and cultures, and to produce teachers and elevate their status.

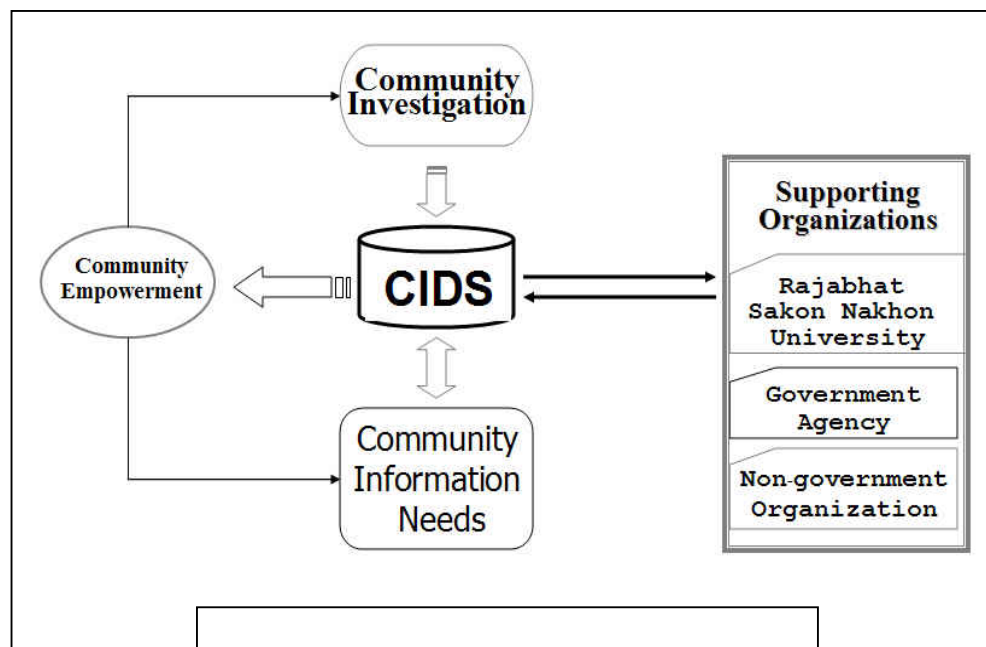


Figure 7. The CIDS and Community Information Needs Model.

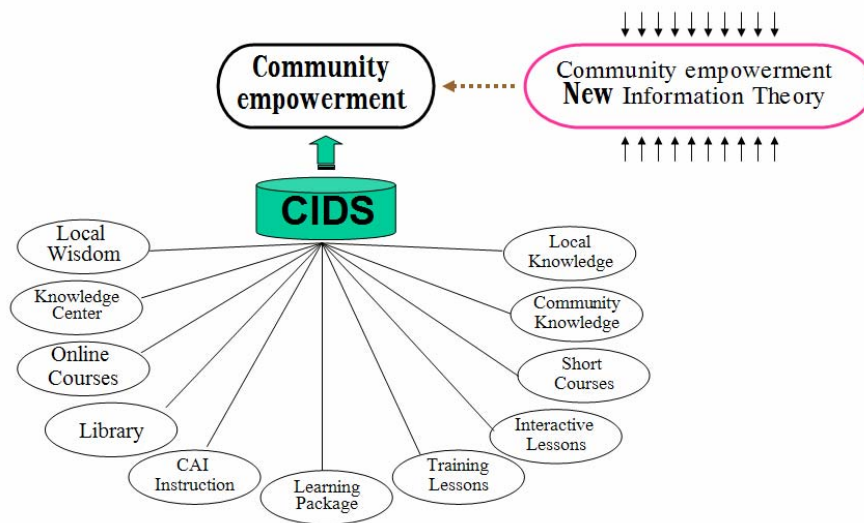


Figure 8 The CIDS and Community Empowerment

Figures 7 and 8 above show the significance of CIDS which acts as the knowledge bank of the community. Besides collecting all knowledge in the community database system, it also supports non-formal education. It is the intelligence storage of the community that will promote self-support and self-development, CIDS will be a source of new knowledge that encourages new information theory which strengthens the community.

RESEARCH METHODOLOGY

The area covered by the research is in some selected communities of Inpeng Community Network (ICN) which consists of 800 communities from 84 sub-districts in 4 provinces in the Northeast of Thailand - Sakon Nakhon, Mukdaharn, Udonrthani and Kalasin. The target population includes community members, community coordinators and local knowledge experts. The reason why some Inpeng communities are selected is because Inpeng community network has been considered a network of strong communities through self-support and empowerment. This study has several phases. The first phase involves a survey to obtain descriptive information and incorporates an action research perspective and evaluation of a community database.

There are three steps in collecting data. Firstly, the researcher visited the community and provided a questionnaire to respondents. Secondly, questionnaire was administered using SPSS package and other electronic tools. Thirdly, the researcher returned to the community and conducted interviewing and tape recording and/or digital video recording and/or other electronic recording of some local knowledge detail from the target population obtained from the first step.

The next phase involves information categorization: This phase includes the examination of the community information needs and local knowledge and the selection of a classification scheme that can be applied, which will be suitable for the retrieval of local knowledge. This is facilitated by creating subject headings, designing worksheet formats for information using the Sear List of Subject Headings of the Library of Congress cataloging of publication of data.

Phase III is about database model design: This phase includes the design and development of an appropriate community database system prototype, the design of a homepage and WebPages by using

the library automation software such as INNOPAC, VTLS, HOLIZON and/or other electronic tools. The community information database network system is also setup between the Rajabhat University and the Community Learning Center (CLC) in the community for testing and evaluation.

Phase IV includes testing and evaluation of the community information database system, by questionnaires and interviews to the end-users in the community in aspects of the usefulness and the convenience in search facilities of the CIDS. Other tasks cover the classification of community information needs and the computer network system analysis, the assessment of the database model and the network between the community and the Rajabhat University.

Phase V: Recommendations: Recommendations will be obtained to improve the community information database system.

RESULTS & DISCUSSION

The data is collected from 465 respondents comprising community members, community leaders, community experts and officers of some government offices in the Inpeng Community Network. Table 1 shows the main outcomes regarding the information needs and local knowledge of the community in an attempt to determine the answer to the research question: “What are the information needs of the Inpeng community Network?”

<i>Category</i>	<i>Main Outcomes (%)</i>	
Level of need for information	Much	42.8
	Medium	33.8
	Little	18.7
Reason for information need for oneself	Career advancement	28.1
	To be well informed	28.0
	To improve knowledge	25.0
	To find new occupations	17.5
Type of knowledge required	Plant cultivation	22.5
	Animal raising	19.7
	Herb growing	16.9
	Medicines	14.2
Mode of information need	Pictorial / illustrated	22.5
	Audio visual	21.6
	Detailed information	18.1
	Films	16.5
Type of Information Services	Radio / TV	24.2
	General printed material	21.9
	Magazines	18.2
	CIDS	16.5

Table 1: Information Needs & Local Knowledge of the Community

The results showed that there is the highest level of need for information by the majority of community members (42.8 %). Main reasons for information need for oneself include career advancement, to be well informed, to improve one’s knowledge and to find a new occupation. The main types of required knowledge, plant cultivation, animal raising, and herb growing, seem to support the agricultural nature of the rural Thailand. Large number of respondents supported the pictorial, audio visual format of the information required. Finally the delivery mechanism of the needed information should be through radio, TV, printed material, magazines and CIDS. This confirms the acceptance of the CIDS by the community.

Some respondents indicated different information needs from the majority, 2.3 % indicating their needs in the following areas: Weaving Invention, Clothing and Printing, Traditional massage, Agriculture transform, Accounting, Computer and computing, Kitchenette, Organic Fertilizer, Marketing, Animal feed, Fodder, Nature and environment, Politics, Community forest, Trade, Business & Commerce, Technology & Information Technology, Saving, Economics, Agriculture or Farming Tools, and Health.

Another area of this research is to find the local knowledge and local expertise in an attempt to answer the research question “What is the local knowledge of the Inpeng Community Network?” Table 2 summarises the main outcomes from this investigation.

<i>Category</i>	<i>Main Outcomes (%)</i>	
Local knowledge and expertise	Many	62.2
	Not sure	24.3
Level of importance of local knowledge and expertise	Very much	38.7
	Much	45.9
Significance of local knowledge and expertise	Better income	38.7
	Better community	33.0
	Better health	26.1
Level of need for new management of local knowledge for community	Very much	46.2
	Much	25.6
	Medium	8.8
	Little	11.0
Level of need for new management of local knowledge for individual and family	Highest	39.4
	High	29.2
	Medium	12.7
	Little	8.8
Applicability for self development	Highest	36.1
	High	32.0
	Medium	14.4
	Not sure	8.0

Table 2: Local Knowledge of the Community

Most respondents (62.2 %) considered there was much local knowledge and expertise in their community. Only 24.3 % were not sure. In the category of the level of importance of local knowledge and expertise to community, most respondents agreed that they were significant in terms of providing for better income to community (38.7%), better community itself (33%), and for better health (26.1 %). Nobody indicated that they were not significant. There were some other interesting answers for better local knowledge and expertise would result in: Better Environment Conservation, Improvement of their knowledge & their children knowledge, Protection of houses, Love in community, Reducing family expenses, Transfer knowledge into the new generations, Knowledge of background of community, Protection of local knowledge, and Protection of community.

The majority of respondents (46.2 %) stated that there was very high need for new methods to improve their local knowledge. Only 11% of respondents saw little need for this. Similarly, most respondents (39.4%) agreed that the need for new management of local knowledge for individual and family, and applicability for self development was at the highest level.

CONCLUSION

The paper describes the research into the information needs and local knowledge of the community, and the classification and design of a model for a community information database system for rural community development in Thailand. This will empower local communities to deal effectively with their own problems and their own sustainable development. The study is directed towards some 800 communities of Inpeng Community Network (ICN) in 4 provinces in the Northeast of Thailand mainly because of the network's strong self support and empowerment. The research provides valuable data about the information needs and local knowledge and a new theory of community empowerment through information. Another benefit is the CIDS Database architecture that is applicable to rural communities in Thailand. This will empower each local community to create and involve itself and to seek more new knowledge. In addition, the CIDS will benefit the Rajabhat Universities and educational institutions in determining new curricula based on community information needs.

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Ziman, M. Edith Cowan University, Australia. Research and Teaching Nexus, Vital for Teaching and Learning of Genetics

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ABSTRACT

Research is vital for lecturers to remain aware and actively involved in the ever-changing field of genetics. Apart from being a source of up-to-date information, the excitement and enthusiasm engendered by being an active researcher is passed on to students in lectures. For students, it ensures that they are likely to be exposed to relevant problem solving skills and training in current laboratory techniques. Moreover, it is only through research training and enlightenment that students can understand the significance of recent major advances in the field of medical genetics that have arisen as a result of research.

Actively involving undergraduate students in research is becoming popular as a means of educating students in an engaging manner but also provides students with valuable research skills. To teach students the difficult concepts associated with the field of Developmental Genetics, I sought the advice of renowned researchers and devised a strategy that encompassed both laboratory research and literature research assignments. On completion of the unit, students commented that they had learned a significant number of skills and had gained confidence in the value of their own research. The quality of some student assignments was of such a high standard that they have been submitted as peer reviewed journal articles for publication within medium quality journals (Michalczyk and Ziman, 2004).

INTRODUCTION

In the search for novel teaching and learning strategies to aid in the teaching and development of a new undergraduate unit, I sought the advice of several world-renowned researchers by hosting and organising a conference to discuss methodologies. Finally, a research based strategy was agreed upon and was introduced into a third year Developmental Genetics unit. Results presented in this paper provide clear evidence that introducing a research project into an undergraduate degree is a successful teaching and learning strategy and supports and highlights the teaching-research nexus in undergraduate teaching.

The Teaching-Research Nexus

The teaching-research nexus, the interdependence between staff research and student learning, has long been a central feature of higher education both in Australia and world-wide. There have been protests against government proposals to create teaching-focused universities, but there are no clear directions on how to link teaching with research to improve quality of teaching and learning in a higher education system.

It is clear that all higher education institutions benefit from the vital interdependence between teaching and research. Interdependence of teaching and research is central to higher education; it is the feature that distinguishes higher from further education. However the benefits are generally qualitative rather than quantitative and it is apparent that the relationship between teaching and research can never be adequately demonstrated.

The literature provides an extensive range of perspectives on the teaching-research nexus. Numerous studies have investigated the relationship between good teaching and good research and found no significant correlation, indicating that good researchers do not necessarily make good teachers and vice versa (Brew and Boud, 1995a, 1995b; Hattie and Marsh, 1996).

Boyer on the other hand, published extensively to promote teaching and research, and in his view, both are integral in the role of an academic (Boyer, 1987, 1990). Boyer views the responsibility of academics as:

- *the scholarship of discovery* which requires both original research and advancement of knowledge
- *the scholarship of integration* which involves the connection of ideas across discipline boundaries
- *the scholarship of application* which entails the assembly of knowledge through interaction between intellectual and 'real world' problems of practice
- *the scholarship of teaching* which transforms knowledge by bridging the gap between the scholar's understanding and the student's learning.

Neumann (Neumann, 1993a, 1993b) described the teaching-research nexus at universities as both *tangible*, relating to the transmission of advanced knowledge and skills and *intangible* in development of students with analytical skills and a positive attitude towards knowledge acquisition, as a result of being taught by academics/researchers that are stimulated and interested in their subject (figure 1). Interestingly, he also viewed the nexus as operating in reverse as researchers receive new ideas from students and must answer their thought-provoking questions, forcing teachers to clarify their thinking and structure their research concepts clearly (Neumann, 1994).

Student Views on How Research Benefits Their Learning

Students perceptions of the benefits of staff research on student learning was detailed in a recent study performed in the United Kingdom. The study found that students were twice as likely to be positive rather than negative about research. Students also agreed that academic research would augment their learning because of the enthusiasm of lecturers in class. Furthermore the currency of the lecturer's knowledge and their ability to illustrate from personal experience enhanced the lecturer's credibility in the eyes of the students (Lindsay & Jenkins, 1998).

Teaching, Research And Learning: Are There Real Benefits To Learning?

The value of research in teaching and learning is underestimated; there is mounting evidence indicating that students benefit greatly by being involved in research, particularly as an aid to understanding complex information (Dick, 1997; Patrick and Willis, 1998; Kieser and Herbison, 2001). Furthermore, as suggested by a study conducted in New Zealand, research in teaching does not merely provide an output in the process of learning but may be viewed as an experience, a discovery process, a valuable means of gaining insight, understanding and knowledge concomitantly with development of a complex range of skills (Patrick and Willis, 1998; Woodhouse, 1998).

'Learning is the vital link between research and teaching. It is a shared process in these two enterprises. Learning acts as a powerful intervening factor in all of the studies attempting to demonstrate a relationship between teaching and research since it is the process whereby an individual—teacher, researcher, student, learner—comes to know. This is not to say that research is wholly about learning, any more than facilitating learning is the whole of teaching. But it is the significant and substantial element that they share. Teaching and research are correlated when they

are co-related, i.e. when what is being related are two aspects of the same activity: learning..' (Brew and Boud, 1995b, p. 268).

The above statement highlights the symbiotic relationship between research and teaching and the strong connection of these to quality learning (Garnett and Holmes, 1995).

Strengthening the nexus between teaching and research therefore seems strategic given its benefits, especially within an academic environment that is changing rapidly under the combined pressures of policy, technology and community demand (Zubrick et al., 2001). Increasing numbers of individuals are seeking a university education to meet increasingly sophisticated workforce requirements and changing technologies. Progress in meeting students' educational needs with available resources may well require academic commitment to ensuring greater linkages between teaching and research activity (Brew, 1999). Reputations for teaching and research are also becoming intertwined as universities position themselves competitively and define their particular and distinctive approaches to learning (Zubrick et al., 2001).

Several universities in the United Kingdom, such as Oxford Brookes University have now redesigned their undergraduate curricula so that all courses must demonstrate effective links with research as a strategy to enhance both teaching and research; the University of Nottingham ensures that the nexus is central to their courses on teaching; the University of Warwick has developed an undergraduate research scholarship scheme that enables selected students to be members of a research team; and Chester College (with the support of the bioscience centre in the learning and teaching support network) has developed a journal, *Origin*, to publish undergraduate research.

The value of research in teaching has also been recognised at Edith Cowan University, where recent policy is aimed at promoting and linking teaching and research; Strategic Priority number 1 states that *ECU will become a leader in the education of learners for the knowledge based services professions and will be recognised for the quality of its teaching and its learning opportunities in those fields. ECU is a teaching and research university and **research will inform its teaching.*** Thus an effort to implement a teaching and research nexus is in line with recent strategic policies.

So How To Do It?

While there is a plethora of literature indicating a strong relationship between teaching, research and learning (Garnett and Holmes, 1995; Brew and Boud, 1995a; Lindsay and Jenkins, 1998; Healey, 2003), there is a paucity of literature on the use of research as a practical tool to enhance teaching and learning. Research is understood to be an integral part of a postgraduate degree, but there is little evidence of research as a teaching tool to enhance learning within undergraduate courses.

What little evidence there is, suggests that, the best way forward is to reshape curricula by incorporating current research trends at under-graduate level (Garnett & Holmes, 1995). At this level, research can be used to enhance learning in a number of ways:

- providing teachers with a framework for the development of up-to-date course material and research-related projects (Garnett and Holmes, 1995)
- as an effective way of gaining in-depth understanding of content particularly for difficult concepts. (Brew and Boud 1995b)
- seeding discussions about novel ideas, and thus increasing the opportunity for enquiry and critique (Garnett & Holmes, 1995)
- allowing students to engage in research that is relevant to their professional and academic interests which is particularly useful in establishing and maintaining links between theory and practice. This helps to keep both teachers and students in touch with industry, professional practice and world affairs (Garnett & Holmes, 1995)

- another approach to linking research, teaching and learning is for students and teachers to engage in collaborative research. This is useful for inducting students into research methods, and for teachers to gain fresh views on research ideas through student questions and discussion. This approach is likely to promote confidence in both student and teacher (Ramsden and Moses, 1992).

Several examples of undergraduate programs that have benefited from incorporating research into teaching and learning were published in PLANET, a Learning and Teaching Support Network (LTSN) special edition publication. To mention a few articles from the journal; innovative and field based strategies were introduced into Level 1 Geoscience at the University of Adelaide to link teaching and research, (James et al., 2003); departmental conferences including student research papers were used as a vehicle to link pedagogical and research activities at Bath Spa University College, UK (McGuinness and Simm, 2003); and a field course was utilised to as a case study for developing team research expertise, linking teaching and research (Plater, et al., 2003).

Even within my own teaching, I routinely draw on my own research expertise to introduce discussion and awareness on current trends in medical research and to provide a natural integration of teaching and research in topical areas. For example,

- a. Within a first year unit, teaching and research are integrated as students are introduced to gene cloning and developmental genetics.
- b. Within their second year, biochemical pathways of blood-clotting are taught alongside advances in gene cloning technology which highlights recent major advances in medical genetics - every enzyme required for treatment of blood-clotting disorders can be produced in a test tube.
- c. In the third year of their degree, students are exposed to detailed descriptions and discussions on the use of transgenic animals. Moreover, lectures cover the latest trends and methodologies in adult and embryonic stem cell research and students are made aware of current research trends aimed at utilising genetically modified stem cells to repair damaged adult neural and muscle tissue; students discuss details from a scientific, legal and ethical stand point.

OBJECTIVES OF THIS STUDY:

- ❖ To enhance the nexus between teaching and research.
- ❖ To actively pursue research strategies that promotes quality teaching and learning.

Key questions that assisted me to formulate my objectives to improve learning included:

How can my research be used to enhance student learning?

How can teaching help develop my research?

METHODS

To answer these questions, and to formulate methodologies for establishing a teaching and research nexus for the complex study of Developmental Genetics, I hosted a workshop of colleagues and high profile researchers at a local venue. I was especially keen to improve my teaching and research of this subject as, not only is it extremely interesting but it also requires students to learn and understand highly detailed and complex research methodologies. At present, I teach and coordinate a third year unit on this subject and supervise seven postgraduate students performing research in this area. Thus it is essential for me to maximize students learning, enjoyment and skills at a variety of levels.

From the intensive discussions held at the workshop (Beatty et al., 1997), it was decided that a research project would be introduced into the third year unit. This teaching and learning tool would provide a diversity of teaching - research strategies, and this was deemed to be the most likely way of improving

student learning while building graduate attributes. Constructivist, holistic and problem-based approaches to learning are most likely to lead to advanced graduate attributes thus assisting students to gain employment as sought after professionals in the field of Biomedical Science (McKenzie et al., 2002).

Linking Teaching and Research Within My Undergraduate Genetic Unit?

Undergraduate students were split into groups and assigned a research topic and a suitable postgraduate mentor who provided guidance and insight into current literature and methodological trends. Postgraduate student mentors partially supervised the undergraduate students and topics were integrated with those currently being pursued by the postgraduate students in my research laboratory.

Undergraduate students performed their research project over a 10 week period, during which time they performed experiments in the laboratory and researched current literature articles. Upon completion of their genetic research experiments, students were required to provide an oral and written summary of their research. Those students whose projects were of a sufficiently high standard were encouraged to submit their findings as a peer-reviewed publication in a scientific journal.

In summary:

- ❑ A research topic was assigned to student groups in the first week of semester
- ❑ **Week 1:** Students were provided with a full set of questions to guide their research (Table 1).
- ❑ **Weeks 2-11:** Students performed research experiments in laboratory classes and recorded their results. Students concurrently performed a literature review on their research question.
- ❑ **Weeks 12, 13 :** Student groups present their research and experimental results as an oral and written assignment.

Table 1:
Guidelines To Guide Student Research

1. Describe the gene, discuss its position in the chromosome, any features of the gene, homology throughout phylogeny
2. Describe the protein it encodes, any features of interest, conserved domains, functional domains
3. Describe the function and biochemical mechanism of action of the protein. Discuss the action of the protein in relation to development
4. Discuss any features of the structure of the protein that relate to its function.
5. Describe the major sites of expression and action of the gene during development. Show experimental results to detail the gene expression during development
6. Describe the effects of mutations of the gene or any diseases that arise as a result of a gain or loss of the gene/protein.
7. Provide evidence that allows the audience to gain an understanding of the vital importance of this gene in development.

Students need good research and critical appraisal skills to pursue the research project and need to become proficient at critical analysis of relevant, quality, published information. In order to assist student in gaining these skills, I provided examples of thorough research practices, pointing out specific details from recent journal articles. Students were encouraged to research their chosen topic utilising quality, peer-reviewed journal articles, Internet sites and textbooks.

Each student is required to submit their research assignment as a journal article, suitable for publication in a peer reviewed scientific journal.

Students evaluated the unit through internal feedback questionnaires as well as through a formal questionnaire administered centrally by the faculty administration.

THE OUTCOMES OF THIS STUDY.

The outcomes were wide-ranging. Firstly, these activities included an increased awareness of novel teaching and learning strategies in the field of developmental genetics. Secondly, it provided opportunities for me to network and exchange ideas with current national and international experts. Thirdly, it highlighted the importance of a teaching and research nexus as a teaching tool as student learning was maximized – the principal pedagogical objective.

Assessment of the outcomes were measured by suitable, relevant indicators

Introduction of a novel research project as a teaching strategy improved UTEI (university teaching evaluation indices) scores indicated student satisfaction. (a UTEI score of 85 was obtained for this unit)

Students displayed improved understanding of complex genetic research; this was clear from the quality of oral presentations, in which students discussed complex data with confidence.

Improved student learning was demonstrated by production of high quality student research assignments some of which have been submitted for publication in peer reviewed journals.(cf Michalczyk and Ziman, 2004)

Publication of this pedagogical research detailing the importance of linking teaching and research will contribute to current literature.

CONCLUSION

Research ensures that lecturers remain aware and actively involved in the ever-changing field of genetics. It may also be viewed as a source of up-to-date information. Moreover the excitement and enthusiasm engendered by being an active researcher is evident to students, and assists academics to teach students the value and significance of recent major advances in the field of medical genetics. Students who have battled through their own small research project can appreciate to some extent, the excitement as well as the persistence, hard work and foresight required to produce ground-breaking research.

Student understanding of research, the ability to analyse, and research skills themselves are essential to a new knowledge economy. Only within the framework of universities and as university teachers, do we have the resources to include research within an expanded higher education sector (Brew, 1999). Moreover students gain valuable graduate attributes, now required for employment in genetic laboratories.

Overall I found that:

- teaching and research operates productively in both directions;
- pooling of ideas created interdependence between research and teaching for the benefit of students, staff and the institution;
- Examples of a nexus were already evident in many areas of my undergraduate teaching and learning,
- these activities simultaneously accomplished teaching and research goals and fulfilled scholarly objectives through pedagogic research
- The rate of knowledge change within the discipline is an important factor in driving the essential nature of this nexus.
- However, my research did not advance dramatically as a result of student research projects, but the major advances in student understanding and learning far outweighed this negative aspect of the study.

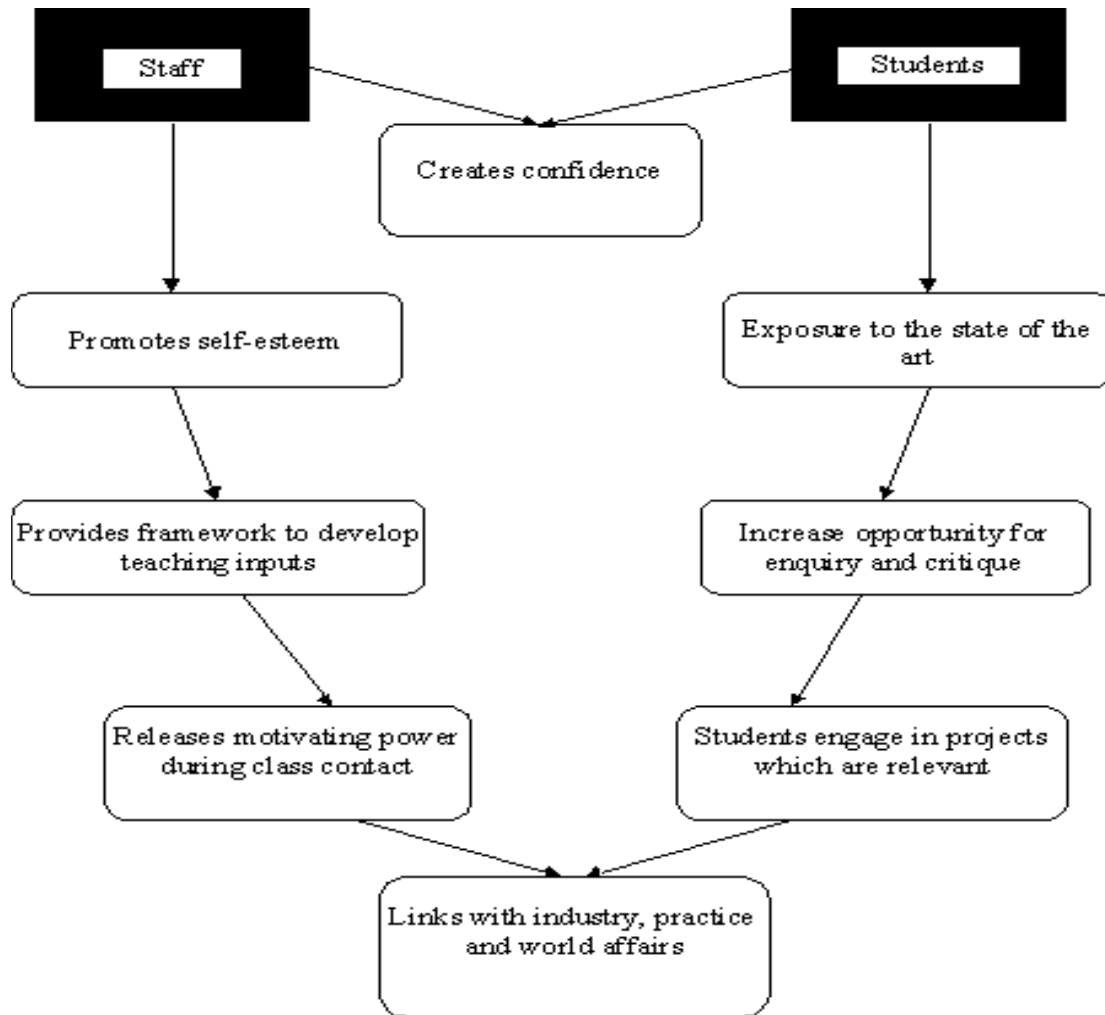
Incredibly there still remains amongst students, a great deal of misconception about the purpose and importance of research and the expectations placed on academics to do research. There is insufficient knowledge of the fact that academics actually do any research or anything other than undergraduate teaching (Lindsay and Jenkins, 1998; personal observations).

To improve this situation and to instill in students an ethos of learning and research, strategies that link teaching/research and student learning should be actively pursued by academics as it remains the objective of most academics to continually strive to contribute to knowledge through the provision of quality learning and the development of quality research. It is anticipated that the ideas presented in this paper will provide welcome strategies to academics keen to integrate teaching and research to enhance student learning.

FIGURE 1

THE BENEFITS OF RESEARCH IN TEACHING AND LEARNING

(adapted from Garnett and Holmes, 1995)



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TABLE OF CONTENTS – SECTION THREE – WORK IN PROGRESS

Connolly, F. EPTI Ireland. Crossing the Boundaries 'Overcoming the difficulties associated with the increasing popularity of higher Education in Ireland for International Students'

In the early 1990's, Finian Connolly left the public sector of the education system in Ireland to set up his own institute. Almost a decade later his institute, Executive and Professional Tertiary Institute (EPTI), formed a partnership with Edith Cowan University (ECU). Since its inception EPTI have looked to the overseas market predominantly in Europe and Asia for its students. A wide variety of courses have been offered over the years from individual one to one short-term courses for Business Executives to diploma, degree and masters level in IT and Business.

The challenges in growing and developing higher education across boundaries in this manner have encountered a number of obstacles. The paper proposes to deal and define these obstacles such as language barriers in marketing and language levels for entry into courses. The language level is the concept of achieving a certain IELTS or TOEIC level to satisfy visa or academic entry and the concept of being able to study properly in English. This is a major failing in the system which can make students believe they have the proper English level because they have been coached to do an exam in a certain way to achieve a grade, but this does not necessarily mean they can understand the topic and handle such matters as research methods, taking notes, study skills etc through the medium of English. Other obstacles that are paramount are events outside the institutes control such as the effect of SARS and 9/11. The concept of selling a partnership with the globalisation of education further complicates the matter. Markets are dynamic and courses need to be dynamic to change with the needs of the market. This particularly applies to IT and Business courses if they wish to keep up with the changes that are occurring rapidly.

Different second level education systems leading to different exit exams require careful thought in entry requirements to the third level courses. The idea of dealing with this with University Access Programmes and Foundation Programmes can lengthen student's time in third level education adding further costs to the student and its family. To the institute the increase cost in marketing and marketing materials has a major effect on the pricing of courses. This in itself is further complicated by the increased competition from other institutes and other countries. Back in the institute, further obstacles are encountered with multi-culture classes requiring a proper environment to be attained, which will be suitable for learning. Last but not least is the issue of visas which are decided in the Department of Foreign Affairs where staff may not be aware of academic procedures and may also not be in the same frame of mind as the Department of Finance or the Department of Trade with regard to the importance of revenue to the institute and the country. Institutes can become increasingly frustrated in their efforts to acquire genuine, quality students but are sometimes thwarted by inconsistent decisions based on financial backgrounds and lack of understanding of academic qualifications.

The final section of the paper will deal with how EPTI have endeavoured to overcome these in its development in the past and how it looks towards the future.

Introduction

Finian Connolly, Managing Director of Executive and Professional Tertiary Institute was educated at Franciscan College in Gormanston, Co Meath Ireland and Maynooth National University of Ireland where he completed a Bachelor of Arts and Post-Graduate Diploma in Education. Following his graduation he worked for a number of years in public sector education. In the early 1990's he left the public sector to set up his own education institute from which developed EPTI (Executive and Professional Tertiary Institute).

EPTI

Executive & Professional Tertiary Institute provides quality training courses to non-native English speaking professionals worldwide. Our client base varies from business executives to groups of young adult students following general and specialised English language programmes, pre-university and third-level courses. Consultancy in training, testing and education is provided to corporations worldwide. It is our aim to provide programmes that cater for the individual needs of our students, even those participating in group courses, who wish to become effective communicators in the specialised language of their profession or industry. The Institute's success can be attributed to our professional employees who are fully committed to its aims and objectives. Enthusiastic tutors employ both modern and traditional methodologies in the classroom to encourage enjoyable and productive learning. Our academic staff are native English-speaking university graduates, most holding post-graduate qualifications, with wide-ranging and diverse work experiences gained locally and internationally.

EPTI/ECU Partnership

On the 9th of September 2001 EPTI signed a partnership agreement with Edith Cowan University. This partnership agreement effectively brought ECU and its courses to Ireland through the medium of EPTI. The partnership is unique. ECU as a progressive, outward looking, global university have their own ideas and concepts as to how their courses can be operated, managed and controlled offshore, thus eliminating the concept of franchising. Through this partnership EPTI can offer a range of ECU courses to both national and non-national students. The courses offered are in IT (Diploma, Bachelor, Post-Graduate and Masters), Business (Diploma, Bachelor, Post-Graduate and Masters), Bachelor of Travel and Tourism and the Nursing Conversion Programme.

EPTI's Aim

EPTI's aim is to attract international students to Ireland. For this reason EPTI has set up an office in Asia, based in Beijing. The Irish market for private, fee paying, third level institutions has been affected by; a small population, a demographic trend towards smaller families and the introduction of free third level education for Irish nationals; thus private institutions have to look abroad for their students base as they cannot compete in the indigenous market. The ECU model offers international students the opportunity to avail of a truly multi-cultural education as their courses can be offered as a 2+1 or a 1+2.

Barriers To Crossing Boundaries

Innovative and exciting as it may seem there are some difficulties attached to delivering this new approach. The first apparent obstacle comes in the way of language. As the courses are carried out in English, set standards of English are required. These levels are usually identified by one or more of the international testing systems e.g. IELTS, TOEIC, TOEFL etc. For me this is a major failing in the system. Achieving a level in these tests does not necessarily guarantee a non-native English speaker that they can follow and study a course through the medium of English (Cripper and Davis, 1998; Elder, 1993; Ferguson and White, 1993; Cotton and Conrow, 1998; Hill et al, 1999: cited in Feast 2004). In fact these tests, in my opinion from experience, very often give a false impression to the student of their English language ability as they usually take part in a preparation course, which coaches them to achieve a certain result. I often equate this to people who are trained and given lessons for their driving test. They are coached as to what to do and what not to do during the test but this does not necessarily prepare them for how to drive in real situations and overcome difficulties that

may be encountered. A certain number of studies would suggest that there is no strong correlation between performance in English testing and academic success (Dooley 1999). However, it has to be noted that many studies find that academic success is related to English proficiency. It is my opinion that students who intend to study through English, where English is not their first language, should undertake a proper University Access Programme where items such as taking notes, study skills, research methodology etc. are part of the course and will therefore prepare them for a third level course. Language items such as idiomatic phrases and other peculiarities of the English language need to be addressed in order for the students to reach an appropriate level of language ability.

Complicating the English language issue is the fact that some immigration and visa authorities apply their own regulations regarding entry requirements into a country. These entry requirements are very often set without consultation with the third level colleges. Therefore situations can arise where visa regulations require a minimum of 5.5 IELTS or equivalent but in actual fact the academic requirement may be 6.5 IELTS, which would be more appropriate. Despite this being made clear to agents and students the problem often arises of the student arriving and insisting, because they met the visa requirements for English, they are entitled to do the course because they were allowed into the country. Trying to explain the reality of the situation to the students can be extremely difficult and what is even more difficult is advising the students to study academic English in order to reach an appropriate level. They feel this is not why they have come to the country so why should they do it. To allow students to enter a course without the necessary level of English is setting them up to fail and I would consider it to be unprofessional, unethical and even go so far as to say it is fraud.

Finally, on the English language issue, the area of marketing is a minefield. Direct translations of brochures into foreign languages can very often lead to misinterpretation. Using agents in some countries where the agent is more concerned with his own financial gain from processing the visas can lead to students being misinformed regarding courses. A third problem is a socio-linguistic one which can make direct marketing for the institute more difficult.

Moving away from the language barrier, world events can also create barriers to crossing boundaries. These events are outside the control of the institute and if dwelt upon can in fact be frightening, as they can have an adverse effect on the recruitment of students. For example SARS, 9/11 and other terrorist events. The impact that the Madrid bombings had on the reduction in numbers of EFL students travelling to Ireland in the summer of 2004 is a good example. Air disasters such as the planeload of Russian students going to Southern Europe, natural disasters such as earthquakes etc. in regions that are known as student market areas can again negatively affect recruitment.

Changing economic circumstances in regions can reduce parents' access to finance, which can hinder a student wishing to go abroad.

Political decisions by governments and authorities in allowing their student population to go abroad with the possible loss of a future workforce may limit the number of students. On the other hand, some governments see their young population going abroad and gaining valuable education and experience as being a positive factor in relation to economic and social development. We must not forget of course the attitude of the country where the institute is located. Political decisions that limit numbers from certain regions may have a major impact on the institute as they might have marketed heavily in a region only to find that all their efforts have been in vain due to political decisions.

The partnership between ECU and EPTI is novel and innovative. For these reasons selling the partnership in the international market was difficult in the beginning due to people's lack of understanding or because it is a new concept and it takes time for it to be assimilated and accepted. There are many difficulties in making people aware of the issues involved in this type of relationship but we believe that people are beginning to see the advantages of the partnership idea and the difficulties are largely disappearing. Ministries of education and educational departments of embassies have got to be made aware of the relationship. This takes time, as getting appointments to meet the right people can be difficult. They realise that the partnership does not conform to any of

their existing structures and this anomaly causes bureaucratic inertia. For example, the Ministry for Education in Ireland recognises awards in Ireland which either come from national universities or are accredited by the Higher Education Training Awards Council (HETAC). ECU in turn as a national university of Australia comes under the Australian system and is also subject to the Australian Universities Quality Agency (AUQA) as a method of quality control. However, because of this situation, EPTI may not be listed as a recognised third level institute in some countries as they take their listing directly from the Irish Ministry of Education. If true globalisation of Education is to occur then ministries of education and controlling bodies must cross this boundary and give recognition to this type of situation.

The nature of markets is that they are dynamic and educational courses need to be dynamic also in order to keep abreast of the changing needs of the market. This particularly applies to the ECU courses that EPTI operate in the areas of IT, Business and Nursing. Course content must therefore adapt to the rapid changes that are occurring in these various areas. The partnership with ECU is very attractive in this way in that these faculties are very progressive and ECU recognises the changes occurring in the market since they visit the market continuously. If courses remain static the appeal will be lost to the international students, as the modern student requires courses that are responsive to ongoing developments in the relevant field.

Each country, and even each region within some countries, has different second level educational systems. Each system has its own way of exit assessments and / or exams. These exit assessments or exams coincide with entry requirements to third level education within that country or region. This is another boundary that has to be crossed in the future growth of higher education. Whereas the entry requirements may be suitable if the student wishes to enter third level education in their own country it may not be sufficient for entry to third level education in other countries. Today this difficulty is usually overcome by way of a University Access Programme or Foundation Programme. As a consequence of having to do this type of programme the student's time in education is lengthened and further costs are added to the student and his or her family. In seeking to overcome this difficulty and reduce costs, an increasing number of third level institutes are locating this type of course in the student's country of origin. This can lead to other problems such as monitoring teaching, control of exams, plagiarism etc. I do not propose to comprehensively explore these issues here other than to say that University Access Programmes/Foundation Programmes are not a panacea.

The costs of marketing are rising rapidly e.g. airfares, labour costs, accommodation and living costs for personnel while they are overseas. The need to increase the quality of advertisement material with larger and glossier brochures, e-roms, websites etc. further increases costs. Inevitably the increase in the costs of marketing has a major effect on the cost of courses. Agents demanding higher commissions also increase costs. Competition from increasing numbers of institutes and countries lead to further difficulties in the international market.

Away from the difficulties in relation to marketing there are many obstacles that have to be overcome in the actual delivery of the programmes. If you have a class of one nationality or culture then you have a certain teaching environment for this class. However, if you mix nationalities or cultures in a classroom it requires a different environment to be developed for good learning. The constitution of multi-cultural classes must be done with an awareness of cultural differences such as Sabbath days etc. Without proper cognisance of the myriad of difficulties that may arise in a multi-cultural educational context an effective learning atmosphere will not exist. Therefore there must be an induction programme for international students undertaking a programme at an institute, but there must also be an awareness programme for the existing national students regarding their future classmates. This, in many ways, can be a more serious boundary to be crossed than some of the other issues mentioned above.

In conclusion I will mention the issuing of visas. In most countries visas are applied for and decisions made by public officials in the Department of Foreign Affairs. One of the difficulties that arises with this situation is that many of these public servants may not be aware of academic procedures required for entry to third level education. This is not a point of criticism but rather a realisation that being

dynamic in the face of change is preferable to remaining static. Entry requirements need to change in line with other changes occurring in society. It is very important that third level institutes involved in international recruitment have close contact with the civil servants in the relevant departments so that there can be a mutual understanding of what needs to be achieved. Within government, Departments of Finance, Trade, Education and Foreign Affairs have their own views on international education and what it means. For the globalisation of education to occur, governments must develop a comprehensive policy in relation to international education. There must be comprehensive and effective entry and exit strategies.

Institutes can become increasingly frustrated in their efforts to acquire genuine quality students and are sometimes thwarted by inconsistent decisions, be it on financial grounds or lack of understanding of academic qualifications, by government authorities. To use a football or as I am in Asia a soccer analogy, if the playing field is level for everybody and the goalposts are not moved during the game then everybody gets a fair chance.

EPTI's Attempts to Cross the Boundaries

Since venturing into the international market EPTI has had to deal with the above problems and solutions often only temporary. However, awareness of the difficulties is the first step involved in overcoming these difficulties. Various methods and procedures have been tried and tested, some with success and some without, but a number of underlying factors have been extremely important throughout this time.

Research by our staff has shown that many of the difficulties that students have relate to extra curricular areas particularly adjusting to 'culture shock'. This can cause motivational and attendance problems and if not overcome will eventually lead to academic underachievement. With this in mind, we have developed a module in the early stages of the University Access Programme, which addresses these problems. By providing this value added element to the course students are made aware that their problems are not unique and can be overcome. This is helping to address the real issues in a positive and pro-active way.

Realising the importance of the Asian market and establishing a permanent presence in the region has been instrumental in dealing with the problems of crossing boundaries in the growth of higher education. Having Irish nationals, who understand the Irish education system, permanently out in the field is reassuring to agents and students. In return these personnel, by being close to the market, can give important feedback to the institute with regard to the needs and requirements of the market place. They are able to monitor changes as they occur and in some parts of this region these changes are quite frequent. Although there is a high cost factor involved the importance of establishing an office is linked to the long-term development of the institute rather than the short term.

In Ireland we are extremely lucky to have a very well organised government body (Enterprise Ireland) whose aim is to increase trade between Ireland and other countries with particular emphasis on the benefits for Ireland. The international services section of this organisation is responsible for education. This section arranges participation in Education Exhibitions, Trade Missions and other events in an effort to promote Ireland as a centre of education. By being invited by Enterprise Ireland to participate in these events EPTI has been able to develop and has begun to establish recognition as a centre providing high quality education. Enterprise Ireland is also very active in liaising between the various government departments such as Foreign Affairs, Trade and Education. Their links with these government departments allow members difficulties and suggestions to be heard by the relevant authorities. The organisation also promotes regular meetings between the third level colleges facilitating collective interaction.

Significant investment by successive Irish Governments in education which has given us an internationally recognised quality education system (OECD Report 2004). Over 60% of all Irish students continue on to Third Level studies which is one of the highest within Europe (HEA 2003).

This has produced a good availability of well qualified workforce at both degree and technical levels which has been a major factor in our success in attracting over 1,400 overseas companies to set up their manufacturing and development centres in Ireland for Europe and the Asia / Pacific markets (IDA 2003). It is worth noting that Ireland now attracts over 38 % of all US I C T investment into Europe (IDA 2003). Our growing and expanding economy adds to the attraction of studying in Ireland.

When the quality of our education system is allied with a beautiful, secure and friendly environment it can be more easily understood why the number of international students selecting Irish Colleges for their Third Level studies has been steadily growing over the past four years as the number of Irish students stabilised (HEA 2003).

Our partnership with Edith Cowan University has been instrumental in overcoming the previously mentioned difficulties. ECU's reputation as a provider of quality education and it's innovative and dynamic approach to education has made ECU a pioneer in global education. In the early days of our partnership EPTI trod a lonely path trying to establish a reputation. It was only when we started to use our logo along side ECU's logo that people began to awaken and take notice. The experience that has been gained in such a short time by EPTI, both in terms of academic delivery and marketing, by working closely with ECU personnel, has been immense. No doubt as we move further down the road the boundaries will lessen and the concept of international, global, higher education will become clearer. Having said that there are still a number of difficulties to be overcome. With this in mind we should remember the saying 'never look back, try harder in the future as tomorrow is another day'.

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Simbar, R. *The Islamic Azad University, Rasht Branch. Iran.* Higher Education, and the Challenge Of Growth and Sustainability

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Abstract

The first part of this paper explains the linkage among higher education, internationalization, development and social justice. The paper argues that universities are institution that, in all societies, have performed basic functions which result from the particular, combination of cultural and ideological, social and economic, educational and scientific roles that have been assigned to them. They are multi-purpose or multi-product institutions, which contribute to the generation and transmission of ideology, the selection and formation of elites, the social development and educational upgrading of societies, the production and application of knowledge and the training of the highly skilled labor force. This range of functions and duties shapes the main tasks of higher education systems, albeit with different emphases depending on the national context, the historical period, the specific sector and indeed the institution concerned. But what is clear is that nowadays, universities are highly involved in literally every kind of social and economic activity in our increasingly dynamic societies.

The second part of this paper discuss another closely related and important issue of concern in the development of education in the last quarter century refers to private higher education. Private education is not a new phenomenon in many countries, though modern private education is of recent origins. The paper argues different aspects in private higher education and discuss myth and realities about privatization of higher education. This paper suggest that initial government investment on a large scale are important in higher education; but only after some time, and certain level of educational and economic development is achieved private sector can or may complement the state effort in higher education .

Introduction

The modern university as a project of the nation state and its cultural identity, find itself in a complicated and indeed delicate situation at the moment (Kweik 2000). Universities are institution that, in all societies, have performed basic functions which result from the particular, combination of cultural and ideological, social and economic, educational and scientific roles that have been assigned to them . They are multi-purpose or multi-product institutions which contribute to the generation and transmission of ideology, the selection and formation of elites, the social development and educational upgrading of societies, the production and application of knowledge and the training of the highly skilled labour force. This range of functions and duties shapes the main tasks of higher education systems, albeit with different emphases depending on the national context, the historical period, the specific sector and indeed the institution concerned. But what is clear is that nowadays, universities are highly involved in literally every kind of social and economic activity in our increasingly dynamic societies.

A review of the complex and dynamic processes of internationalization at different levels in higher education reveals that these processes are prompting increasingly rapid change in two rather different aspects (Teichler, 99). First, there is now a wide range of border crossing activities, many of them resulting from institutional rather than governmental initiatives, and these are certainly still on the rise. But we can also see more substantial changes towards systematic national or supra-national policies, combined with a growing awareness of issues of international cooperation and competition in a globalising higher education market. Under the first heading there is a growth of specific, clearly visible international co-operation, including activities such as student and staff mobility schemes, co-operative research activities and foreign language teaching to support them; under the second, we can see trends towards internationalization, regionalisation of the actual substance and structure of higher education, such as, proposals for convergence in institutional patterns, study programmes or curricula.

The contemporary university was born of the nation-state, and it was only in the nineteenth and twentieth centuries, following the establishment of clear national economic interests, that universities acquired their identification with science and technology. Their regulatory and funding context was, and still is, national; their contribution to national cultures was and still is, significant; students tended to be, and still are, trained to become national functionaries; and universities played, and still play, a considerable role in what some have called the military industrial complex of nation-states. In this perspective, they are very much national institutions. It is appropriate, therefore, to see current trends as part of a process by which national systems of higher education are being challenged by new forces of internationalization. Universities are thus object as well as subject of "internationalization" or "globalisation". They are affected by and at the same time influence these processes.

One of the key features of globalization is increased competition. Competition has become a driving force for innovation and entrepreneurship. Competition in higher education has increased and has become unfair. Countries of the North with their competitive advantage compete with countries from the South, for best students, faculty, administrators, and researchers. As a result the intellectual resources from the South are being drained in the process. It is estimated that Africa has lost 100,000 people with specific skills to the West (Bollag, 2001). The loss is estimated at about 23,000 qualified academic professionals each year for Africa. The countries reported to lose the most academics are Egypt, Ghana, Kenya, Nigeria, and South Africa, Russia reports a loss of 30,000 researchers (The Chronicle, September 8, 2000). Brain drain is reported to be the greatest obstacle to development.

Countries from the South are at risk of being further marginalized if their higher education institutions fail to participate in the knowledge production networks and activities that would make them relevant and more responsive to needs of a new economy. A concern has been raised by academics from the South about lack of collegiality and concern amongst academics from the South and those from the North within a competitive environment. Competition has resulted in student losses to private for-profit higher education, loss of jobs, and in some cases the threat of closure of institutions. Competition in academia has continued to perpetuate the negative effect of globalization such as increasing inequality both between academics within institutions and between academics in different institutions and countries (Moja and Cloete 2001).

Higher Education and Development

Overall globalization apartheid has had a devastating effect on developing countries. There have been acknowledgements from the World Bank that the benefits of globalization are not being passed on to Sub-Saharan Africa and instead globalization has exacerbated many of Africa's problems. Trade relations are reported to be unfavorable for Africa and as a result the percentage of trade has dropped in the last two decades. There are warnings and signals of the possibility that developing countries are at risk of being excluded from the dynamic of the world economy (World Bank Report 2002, Castells 1996). Some argue that to reverse the situation there is need to radically rethink policies imposed on developing countries in areas such as trade agreements. He further argues that for globalization to benefit all there is need to share growth in a more equitable way.

There is need to raise the issue of the role of higher education in development in the context of regions such as Africa where nearly half of Sub-Saharan Africa's 600 million people live on less than \$1.00 a day, more than a third of children are malnourished, people are dying of AIDS with minimal improvements in education and health. In the globalizing economy higher education has featured on the WTO agenda not for its contribution to development but more as a service to trade in or a commodity for boosting income for countries that have the ability to trade in this area and export their higher education programs. Higher education has become a multi-billion dollar market as the quantity of education is increasing rapidly and it is reported to double every five years. It is reported that the export of higher education service has

contributed significantly to the economy of the US. In 1999 it is estimated that the US, being the largest provider of education services, earned \$8.5 billion of the \$30 billion market, from this trade alone (Heyward,2002).

There is need to rethink the role of higher education in national development as national economies are slowly being replaced by a global economy and national higher education is being slowly replaced by global systems of higher education. Higher education role has shifted more to supporting an economy that is knowledge intensive at a global level. The relevance of higher education systems at local levels needs to be rethought in the framework of their relevance in the global context, hence the question as to whether they are still relevant to development at a local level. Changes taking place have put a lot of emphasis on the need for accountability to society beyond financial accountability, demand for intellectual leadership, and partnership that could contribute to development.

Misperceptions about higher education's role in truly sustainable development have persisted for too long. No modern country has become prosperous without a strong higher education system. Yet this has not persuaded some from wondering whether poorer countries can afford to invest in higher education. But it is lack of investment in higher education-within a comprehensive approach to sound education at all levels-that continues to hamper out efforts to eliminate poverty, we should be clear and unequivocal in the reasons why poverty cannot be overcome without the benefits of higher education while we get on with the work of building stable, high quality higher education systems in all countries.

This paper discusses on higher education's value added to development with respect to capacity enhancement at the individual, institutional and social levels; science and technology, for the knowledge needed to tackle problem of health, food security, sustainable use of the environment, among others; The knowledge economy-to integrate knowledge production, application, and dissemination; productivity-and its links to prosperity.

Lessons over the last decades of development assistance point to the critical role of capacity enhancement in promoting sustainable development. At the heart of capacity enhancement is the importance of intellectual capacity in analyzing national development challenges; formulating policy options to patient record management specialists, etc. All acquired their particular skills through some type of tertiary education.

We know also that flexibility and adaptability are needed in both the labor force and in social institutions. Higher education develops the cognitive abilities that allow individuals to adapt to a greater range complex social situations. The resulting differentiation is the basis of a number of key institutions and practices that allow countries to maintain a high level of wealth and well-being .

Research on the benefits of higher education confirms its ability to influence people's skills and behaviors in ways that facilitate the transformation to the more knowledge-rich, flexible, adaptable forms of social organization associated with prosperity. A comprehensive study from Great Britain found that university graduates:

- Had higher levels of earnings than both the population in general and their parents.
- Were employed in jobs that required multiple skills, especially computer skills,
- Had better overall health, with lower levels of cigarette smoking, obesity, less depression and a greater overall sense of well-being. Held beliefs and attitudes more conducive to social cohesion and civic harmony, including a greater belief in racial equality. Less unquestioning acceptance of authority, higher voting rates, more community volunteerism, and-among those with children-greater involvement in parent teacher associations;(Revisiting the Benefits of Higher Education; Report by the Bedford Group for lifecourse and statistical studies, Institute of Education, April, 2003).

Private Higher Education and Different Arguments

Another closely related and important issue of concern in the development of education in the last quarter century refers to private higher education. Many of the private institutions are privately managed, but are funded by the State to a substantial extent. 'complete' or 'pure' private institutions may now be very few in number; but they are rapidly increasing in number.

Private higher education institutions in education have been growing rapidly in all countries. The private sector meets a large part of the demand for higher education 70 per cent in Japan, Korea, and Taiwan. As high as 73 per cent of all universities, 84 per cent of all junior colleges in Japan are private, enrolling more than 70 per cent of total students in these institutions in 1992. Korea provides yet another example of extensive higher education operated by the private sector: 84 per cent of higher education institutions and nearly 80 per cent of higher education enrollment were in the private sector in 1993. Private higher education institutions in Taiwan outnumber public institutions 2 to 1, capturing 70 per cent of the enrollment. The share of private enrollment in higher education in Japan, Korea, and Taiwan are among the higher in the world; and no country except the United States has enrollment in private institutions adding up to more than 10 per cent of the total enrolment in higher education, and even there the figure is only 10 per cent. In a sense, the Korean and Japanese experience combined seems to be in sharp contrast to the traditional welfare-state approach -- not to mention the traditionally important role of the state in the provision of education that dominates the pattern of educational development in European economies such as the United Kingdom, Sweden, Switzerland and Italy, and in the United States and Canada as well. Many other economies in East Asia -- Singapore, Taiwan, Hong Kong, and China -- do not rely on private financing to the extent that Korea and Japan do.

Private education has grown, essentially to meet excess demand and differentiated demand for higher education. First, the social demand for higher education exceeds the public supply, and the private market seeks to meet the unsatisfied demand. Secondly, demand for different quality (presumably high quality) and content in education (such as, for example, religious education) also contributes to the growth of privatization. On the supply side, private entrepreneurs are ready to provide higher education either for philanthropic or other altruistic motives, or for profit. The dividends could be quick economic profits, besides social and political gains. The case for privatization of higher education exists mostly on the basis of financial considerations. Public budgets for higher education are at best stagnant, and are indeed declining in real terms, more particularly in relation to other sectors of the economy. Privatization is also favoured on the grounds that it would provide enhanced levels of internal and external efficiency of higher education, and higher quality of education; and as the private sector would have to compete with the public sector, the competition would result in improvement in quality and efficiency not only of private education but also even public higher education. In the long run, due to economies of scale, private institutions provide better quality education at lower cost than public institutions, as in Japan.

On the other hand, privatization is opposed on at least three sets of reasons. The existing market system does not ensure optimum social investment in higher education, as externalities exist in the case of higher education, which is a 'quasi-public good'. The market system also fails to keep consumers well informed of the costs and benefits of higher education. It is likely that the costs of private education are much higher than public education as in the United States and the Republic of Korea. Finally, a private system of higher education is also insensitive to distributional considerations, and in fact contributes to socio-economic inequalities. Accordingly, public education is not only superior to private education, but private institutions cannot even survive without state support.

One of the most common myths is that there is huge demand for private higher education, as private education is qualitatively superior to public education. But the available evidence shows that the higher quality of private education compared with public higher education is

exaggerated. Even the availability of space per student and other facilities are reasonably higher in public universities than in private universities in many countries. For example in Japan private universities spend less than half of what public universities spend per student. It is only in the United States that the difference is in favour of private universities. All this should indicate that quality differences are indeed more favourable to public than to private universities. Yet private universities may sometimes show better results in final examinations, as essentially they admit only the best prepared students with better socioeconomic background. However, 'graduation of the "best" graduates is not by itself a proof of the "best" education'. Even if the quality of output is taken in to consideration, that is, internal efficiency, measured in terms of academic achievement, success rates, drop-out rates, failure rates, etc., private education does not compare favourably.

It is also argued that as the private sector has to compete with the public sector, the efficiency of the former and, equally important, the efficiency of all higher education, including public, improve significantly. But in countries where mass private sectors prevail, or in countries where private sectors play a peripheral role, there is little scope for competition, and as a result, the private sector may turn out to be very inefficient, and even economically corrupt. Thus the arguments on efficiency and quality of private higher education do not withstand any close scrutiny. Secondly, it is widely believed that graduates from private universities receive higher rewards in the labour market in the form of lower unemployment rates, better paid jobs and consequently higher earnings. In short, the external efficiency of private higher education is argued to be greater than public higher education, which would explain the growth of privatization. But the empirical evidence does not support these assumptions. Unemployment rates among graduates from private universities are generally higher than those from public universities in many developing countries. Estimated rates of return, a summary statistic of the external or labour-market efficiency of education show that public higher education pays better than private higher education. (Jimenez and Tan, 1987).

Some argues that private institutions provide considerable relief from financial burden to the governments, as they are self-financing. But as well known, most private institutions are not totally private, at least from a financial standpoint. They receive huge subsidies from the state. It is not only state-aided private institution, but also other private education institution receive subsidies-hidden subsidies in the form of land and material at concessional rates, tax exemptions etc. In all, private institutions do not provide any relief to the government in the form of saving of public of resources. If there is any relief to the government, that is very small, and there is no relief to the people, as these institutions charge huge amounts as fees. Rarely private institutions make any investment of any significant magnitude from their own sources.

Fourthly, it is felt that the private sector responds to the economic needs of the individual and society, and provides relevant types of education. In most countries, private higher education institutions offer mainly low capital-intense disciplines of study. It is true that not only are there few private universities involved in research activities, but they are also involved in providing cheap commercial and vocational training as in the case of several Latin American countries, or in the case of 'parallel' colleges in Kerala in India (Nair and Ajit, 1984). When the potential for economic profit is high, the private sector entered into professional fields and opened engineering and medical colleges, as in India many with poor infrastructure (Kothari, 1986). On the whole, research and broad educational needs of the economy are barely served by the private sector.

It is also claimed that private higher education can improve equity in education, by providing access to many more students, who, otherwise, would not have gone to higher education. It is important to note that private universities are created mainly to protect the 'elitist' character of education, and to keep the masses away from higher education. As private institutions outnumber the public institutions over the years, the government feels no need to establish new public

universities, and as a result, the weaker sections of the society would get permanently marginalized.

It is generally noted that private education is elitist, and caters to the needs of the wealthy. Private universities generally serve a privileged clientele; caters to the needs of the wealthy. The democratization of public higher education has reduced considerably the elitist character of higher education. The social elitism attached to private higher education was found to be one of the most important factors in the growth of an elite private sector in higher education in Latin American countries. The private institution lent an elitist or secular-elitist character to higher education. On the whole, however, as fees in private universities are very high compared with public universities, only the relatively well-to-do opt for private higher education; and 'public universities continue to be the first choice for many' for educational and financial reasons.

Some argue that privatization of higher education improves income distribution, as public funding of higher education, with all its 'perverse effects' is generally found to be regressive (Psacharopoulos, 1977; Blaug, 1982). Again, systematic research has shown that it is not true. As evidence from Japan, one of the few countries to have carried out elaborate investigations on this issue, shows, public universities seem to have higher redistributive effects than private universities in transferring resources from the top income quintile to the other. In many countries, the growth of privatization can be attributed largely to the failure of public universities, while private universities have certainly made positive contributions. Private universities in some countries, such as the United States, have contributed in important and unique ways to diversity, independence, quality, efficiency and innovation (Breneman and Finn, 1978, p.6). In countries like Japan, each private university has its own identity, tradition, culture, etc. In contrast, public universities hardly offer any diversity or individual choice. In this sense, privatization increases the possibilities for individual choice in the type and quality of higher education.

The goals and strategies of the private sector in higher education are on the whole highly injurious to the public interest. First, the private sector has turned the 'non-profit sector' into a high-profit-making sector not only in terms of social and political power, but also in terms of financial returns, and as profits are not allowed in educational enterprises in several countries, private educational enterprises have resorted to illegal activities in education. When governments attempted to regulate profits by allowing state subsidies and restricting fee levels, all the private institutions found they had one thing in common—a demand for subsidies. In the first instance, state subsidies eased financial crisis of the private universities, as in Brazil, and in the long run contributed to 'private enrichment at public expense'

Secondly, by concentrating on profit-yielding, cheap, career-related commercial studies, the market-oriented private universities provide vocational training under the name of 'higher education' and ignore 'broader higher education'. Private universities also totally ignore research, which is essential for sustained development of higher education.

Thirdly, by charging high fees, private institutions create irreparable socio-economic inequities between the poor and rich income groups of the population. Private education is 'socially and economically divisive' (Psacharopoulos and Woodhall, 1985, p.144). Access to higher education by lower income groups is negatively affected by the rapid growth of privatization.

Conclusion

This paper reviewed the level of development of higher education, and then critically examines some of the widely held presumptions on the relationship between higher education and development, including human development and reports significant effects of higher education on development. It demonstrated that no nation that has not expanded reasonably well its higher education system could aspire to achieve high level of socioeconomic transformation.

The paper also reviewed world experience with privatization of higher education and explained some arguments about private higher education. Higher education systems which are predominantly private, may not produce significant economic pay-offs, and certainly will not be able to contribute to the transformation of the developing economies into advanced economies. The role of the state is very important in providing and financing education everywhere. Excessive reliance of the governments on private sector for the development of higher education may lead to strengthening and even produce new inequalities, besides adding to the problem of quality. On the whole, it seems that initial government investments on a large scale are important in higher education; but only after some time, and certain level of educational and economic development is achieved, private sector may or can complement the state efforts in higher education.

Comparing the experiences of several countries, one may conclude that these policies succeeded only in those countries that have invested heavily in education, including specifically higher education. The converse is also true. These policies could not yield good results in those countries that have made low and inadequate levels of investment in higher education, reflected on low levels of educational levels of workforce, as in countries in South Asia, and also in Southeast Asia like Viet Nam, Laos, Cambodia, etc., and many countries in sub-Saharan Africa, compared to the countries in East Asia.

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So, Ming-chuen Allison and Wong, Wai-ying Paulina. Hong Kong Institute of Education. Hong Kong. Collaboration towards effective and quality practical musicianship development in music teacher education programme

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Introduction

Practical musicianship is viewed as one of the basic requirements a music educator needs, particularly a classroom music teacher. Practical musicianship is a broad term, and includes solo and choral singing, conducting, accompanying and improvising at the keyboard. However, these areas have long been delivered either in a one to one or mass teaching and learning mode. The idea of collaborative teaching between two music lecturers at the Hong Kong Institute of Education began after years of co-teaching the same module for the following reasons;

1. all vocal music for schools need keyboard accompaniment;
2. two music lecturers with their distinct expertise in either vocal or keyboard were assigned to teacher the same module;
3. thus, both keyboard and vocal classes use the same repertoire in order to have coherence among the two areas, as well as not to overload the students;
4. combined assessment given by both lecturers in the same session enable students to experience the collaboration and communication skills needed for these two areas;
5. both lecturers evaluate teaching methods and students' progress after each lecture;
6. ultimately, both lecturers give lectures at the same time; this enable students to observe and understand the interpersonal skills in music performance, as well as the integrative elements between vocal and keyboard skills.

This paper reports on the successful attempt in collaborative teaching by two music lecturers in a chosen practical musicianship module through the peer reflective conference and interview of course participants.

Methodology and procedure for data collection

1. Selection of module and course participants
In this study, a co-teach practical musicianship module in the 2003-2004 academic year was selected. It was a three credit point module offered to the Bachelor of Education (Primary) (Four-year full-time) year one music major students.

A total number of 12 course participants took this module. As a usual practice at the HKIEd, all participants are required to complete a course evaluation questionnaire at the end of the module. Thus, a total of twelve questionnaire surveys were completed.

2. End of module questionnaire survey and statistical analysis
The questionnaires were designed by the HKIEd to obtain information from course participants to provide information to programmes and lecturers, for the advancement of the modules and teaching in the future module implementation.

The questionnaire comprised twelve questions and falls into two dimensions:

- I. Module design, teaching, learning and assessment
- II. Overall evaluation.

Dimension I: Module design, teaching, learning and assessment

1. *What was taught matched the aims and objectives in the module outline.*
2. *The progression of the topics was logical and coherent.*
3. *The coursework helped me develop the knowledge and skills identified in the module objectives.*
4. *The learning activities stimulated my interest in the subject.*
5. *The learning activities stimulated my interest in the subject.*
6. *The organization of the module encouraged me to make good use of the resources inside and outside the Institute to learn.*
7. *I understood the assessment requirements early in the module.*
8. *I received useful feedback on my learning.*
9. *For a module of this credit point value, the workload was*

Dimension II: Overall evaluation

10. *The teaching of this module was effective.*
11. *The module was valuable to my professional development as a teacher.*
12. *Through this module, I have become a more independent learner.*

For the co-teach module evaluation, course participants were encouraged to make their overall evaluation of learning performance for the both lecturers. The view of the course participants for Q1-Q8 and Q10-Q12 were indicated by a four point scale, and are defined in this questionnaire as: 4-strongly agree; 3-agree; 2-disagree; and 1-strongly disagree. Q9 was indicated in a three point scale: 1-too light; 2-appropriate; 3-too light.

These ratings were then added, and the mean scores were calculated. The data were for qualitative and comparison purposes. Since the overall number of participants was small, the survey data was used for discussion purposes, and no statistical tests were applied.

Q. No.	Question	Mean
8	I received useful feedback on my learning.	3.45
2	The progression of the topics was logical and coherent.	3.36
3	The coursework helped me develop the knowledge and skills identified in the module objectives.	3.36
4	The learning activities stimulated my interest in the subject.	3.36
10	The teaching of this module was effective.	3.36
1	What was taught matched the aims and objectives in the module outline.	3.27
5	The learning activities inspired me to think.	3.27
7	I understood the assessment requirements early in the module.	3.27
11	The module was valuable to my professional development as a teacher.	3.27
12	Through this module, I have become a more independent learner.	3.18
6	The organization of the module encouraged me to make good use of the resources inside and outside the Institute to learn.	3.09
Overall mean:		3.29

Table 1: Module Profile for Q1-Q8 and Q10-Q12.

3. In-depth semi-structured interview and analysis

Thirty percent of the total numbers of the course participants were selected. Thus, a total of four course participants (one male and three female students) were selected for the group interview at the end of the module.

The questions were designed to obtain information about the course participant's view on the following aspects:

- 1) Do you think the lecturers delivered the module in a collaborative manner? If yes, in what

- aspects?
- 2) How did you view the most useful aspects within the module under the collaborative teaching mode?
 - 3) How did you view and evaluate the effectiveness of the collaborative teaching mode within this module?
 - 4) Any suggestion concerning the issues of teaching, learning, evaluation and assessment within this module for the advancement of the collaborative teaching strategies?

Findings of the semi-structured interviews

All interviewees were eager to express their views concerning the effect of collaborative teaching mode within the selected practical musicianship module. They were also keen to discuss the collaborative teaching strategies for the advancement of the future module implementation. These interview data were analysed, and two major areas of discussion emerged – the positive effect of collaborative teaching mode; and the importance of reflective practices within the teaching and learning process.

Positive effect of collaborative teaching mode

All interviewees felt that it was appropriate that collaborative teaching was regarded as an effective teaching mode in the practical musicianship module. They felt that there was a close interface between solo singing and keyboard accompaniment in the lectures. The collaboration of the two lecturers with distinct expertise in instrumental and vocal musicianship module was best for this dual purpose. For them, it was the best way of carrying out the practical musicianship module in a combined way on ‘what and how to achieve’ for both singers and accompanists.

The reflective practices within the teaching and learning process

There was a clear indication that the interviewees appreciate the lecturer’s aims. It was interesting that the teaching and learning aspects featured prominently in the minds of the interviewees.

Teaching value

The course participants acknowledged the lecturers’ sensitivity and flexibility in dealing with various aspects related to the teaching of instrumental and vocal musicianship. At the same time, they knew they had been carefully trained how to carry out the instructions in vocal singing and accompanying.

Learning value

Course participants were aware of the many benefits within the collaborative music making experience. The learning process of vocal singing and keyboard playing could lead to both musical and personal growth.

Conclusion

The course participants seemed to highly appreciate the collaborative teaching mode and teaching strategies delivered by the two co-teach lecturers within the selected practical musicianship module. It also confirmed that such an experience would benefit their professional development in the future teaching profession.

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Higher education incorporates a typical kind of investment in human resources which involves socio-economic development by promoting knowledge based-skills, technical and professional causes as well as changing employees' attitudes and managerial behaviors. In other words higher education, besides its major role in the promotion of knowledge, tends to further pave the grounds for the research, technological and scientific progresses as the key elements to greater achievements in the modern sciences. One can therefore conclude that universities and other institutes of higher education play a dual role in economy.

Numerous studies on the economic value of higher education reveal that higher education at different levels is closely related to life expectancy and economic development. It is on this premises that has widely admitted the role of higher education in the economic development – both in the technologically advanced economies as well as in the economies of the newly industrialized and developing countries.

In his review of higher education in the developing countries, (Altbach, 1987) concludes that higher education serves as a cornerstone in developing countries; not because it is responsible for educating elite as the pillars of the technologically blessed societies, but in that, it can, as the most vital institution of thought, widely influence the cultural and idea-political spectrums. Universities strive to create and, in particular to promote knowledge in the societies underprivileged with academic elite. Through their writings not only do academics play a central role in the society, but also invigorate the mentality and other aspects of the society by giving consultation to government and industrial sectors. In fact, universities serve as part of a historically rooted international network of knowledge privileged with its modern dimension.

In the development process higher education graduates share with the ingredients of civilization-makers, though creation of modern civilization is not their monopoly. Thus universities are actively engaged in this process, and in close association with other institutes and organs share in shaping civilization.

Therefore as two interdependent elements, employment and development interact with higher education. Development creates job and spread of employment in the society gives momentum to development. Given the role of higher education in jobs creation with the resultant rising employment rate in the society, one can thus conclude that both higher education and development stand on an equal footing.

More specifically, higher education is not merely tasked with the transfer of science and technology to future generations, but it is obliged to teach the younger generation how to actively contribute to social life by sharing its learning for the progress of the society. Hence, in the development process associated with individual socialization, higher education strives to introduce effective solutions to the problems facing the society as an contributor to the national interest. On this premises, higher education is not thus confined merely to the transfer of knowledge and techniques, but with a deeper recognition of national culture grants to the society some kind of capability and insight that cause talents to flourish.

A quick survey of the development trends in the developed countries immediately indicate that development took place in such societies in association of the bodies actively contributing to higher education. The society is heavily dependent on its skilled and expert human resources, which in addition to the scientific and research ability may establish a creative relation with the culture of its society.

In view of the foregoing an endogenous lasting industrial development hinges upon the following elements:

1. Enough quantity of academic and trained human resources.
2. Sufficient quality of academic and trained human resources.
3. Suitable situation for research and development

Higher education, as the main supplier of trained human resources, plays a pivotal role in upgrading the social and economic condition of old societies. Sustainable development will not thus be realized, unless the society is blessed with experienced and committed workforce. A reform in the approaches, attitudes and finally behavioral changes are to be considered as one of the functions of knowledge and insight. It is in this context that education is considered as one of the major indices of social and human development. Given this fact one can clearly observe that there has been always the need to expertise and trained workforce in the process of economic development and wider range of productive activities. By a study of the Developed Countries of the world the role of higher education in development is as follows:

1. To prepare necessary groundwork for the strengthening of growth and development visions
2. To promote science and skills within the framework of educational and counseling duties
3. To produce science and knowledge in the field of development and technology through fundamental research works
4. To find solution to industrial problems through applied researches and specialized services
5. To absorb academic and specialized elite as a pre-requisite for paving the grounds apt to flourish talents.

Quantitative development of higher education:

Some features of higher education in Iran can be referred as follows:

1. Social demand for higher education exceeds the capacity of universities;
2. Government appropriations for expansion of higher education fail to offset social demand;
3. the Iranians Society are prepared to meet expenses of their higher education;

Dealing with an ever-increasing demand for higher education has turned many countries, including Iran to face a challenge of their time in the recent decade. The eruption of social demand is the aftermath of growing number of educationally -apt population ensued by the overwhelming inclinations to university studies. As a result admission capacity of universities as compared to the number of candidates grew drastically scoring up to twice since the time Islamic Azad University joined the higher education cycle.

The sizeable demand for higher education intensified by the low admission capacity of public universities necessitated creation of the Islamic Azad University - a private institute of higher education- as an inevitable reality for the national development in the Islamic Republic of Iran. Since its establishment, IAU has been recognized as one of the universities with unequalled features world over.

Before I get to introduce this university, I deem it necessary to refer to such criticisms as to the expansion of this university and the like. Some argue that expansion of IAU has given rise to qualitative concerns. Those who differentiate between quantitative and qualitative development of university raise such criticisms. Similarly, they believe in some kind of contrast between public and private higher education as well as between planned and unplanned education. Critiques as such maintain that there exists a direct relationship between number of students and quality of education,

adducing that the lower the number of students the better the quality of education. They trust in public higher education, while place no confidence in private higher education. They also argue that higher education should be designed in conjunction with labor market as well as structural needs of the society.

In response to such critique one should say that development is a process which brings about new changes in societies with ancient history. In other words, development means modernizing a society; a process that causes doctrines of the society to undergo changes, thus affecting its cultural, physical and mental structures. Development process can be likened to an old house that should be inevitably destroyed for rebuilding. While such a house requires reconstruction to suit to modern needs, one has to live in it. Similarly development is an intricate process impregnated with crisis and imbalances. Naturally necessary measures should be taken to bar this house from collapsing over its inhabitants during the passing period.

Axiomatically quantitative development does not necessarily means lower quality of higher education; as lower number of students does not necessarily mean better quality of education. However, a university that has hastily undergone quantitative development may not be able to meet qualitative standards; nevertheless it may be regarded as a kind of investment for future qualitative development. Generally speaking none of the universities world over, even in the developed countries, did have the standards expected of them today in the early years of establishment, but they could gradually reach the required standards later.

Does one can categorically defend quality of education in public universities at the expense of private education? Do financial capabilities undermine quality? Do all public universities enjoy a better quality of education, in contrast to private universities? Should universities admit students with due respect to employment rates and cease to exist when they face decline of employment rate? Can one look into the issue differently on the premises that university graduates constitute greater percentage of jobs creation?

Case Study:

Islamic Azad University (IAU) as a successful example of private university:

The Islamic Azad University, as a private university was established in 1982 with the support of the late Imam Khomeini, the great leader of the Islamic Revolution four years after the victory of the Islamic Revolution of Iran in order to meet social demand for higher education. As one of the unequalled private universities world over, IAU has so far registered a remarkable record of development by relying on its own fund that is provided through tuition fees paid by its students without any dependence on government budget. The following is a statistical index of its activities during the past 22 years:

1. Independent university branches:	156
2. Associate educational centers	45
3. Educational centers to become operational	26
4. Total number of students in 2003	968,206
5. Total number of graduates up to 2002	1,014,132
6. Total area used for educational, research, administrative and other purposes	13,614,067 sqm.
7. Total number of faculty members	34,423
8. Total number of employees	23,389

Since 1992 IAU has also established an independent organization, namely "SAMA" which is engaged in the development of public education. This organization has so far admitted nearly 50,000 students and 10,000 technical trainees. Educational centers run by " SAMA" organization are as follows:

1. Kindergartens and pre-schools : 78
2. Elementary schools 97
3. Guidance schools 126
4. High schools 130
5. Pre-university units 128
6. Vocational schools(diploma) 24
7. Vocational centers (Associate) 51

To better clarify the impact of IAU on higher education in Iran it is interesting to note that in 1984 only 10.21% of total candidates for higher education were admitted to universities. Since the time the IAU started its activities alongside the public universities this percentage registered a spiraling trend reaching 25.21% in 2000.

(Table 1)

Year	Candidate s	% of admissions to publi universities	% of admissions to IAU	% of total admissions
1984	351263	10.21	-	10.21
1999	751.851	7.26	8.88	16.14
1994	1.112.587	11.12	13.8	24.9
1999	1.340.532	10.83	11.99	22.82
2000	1.339.228	11.34	13.87	25.21

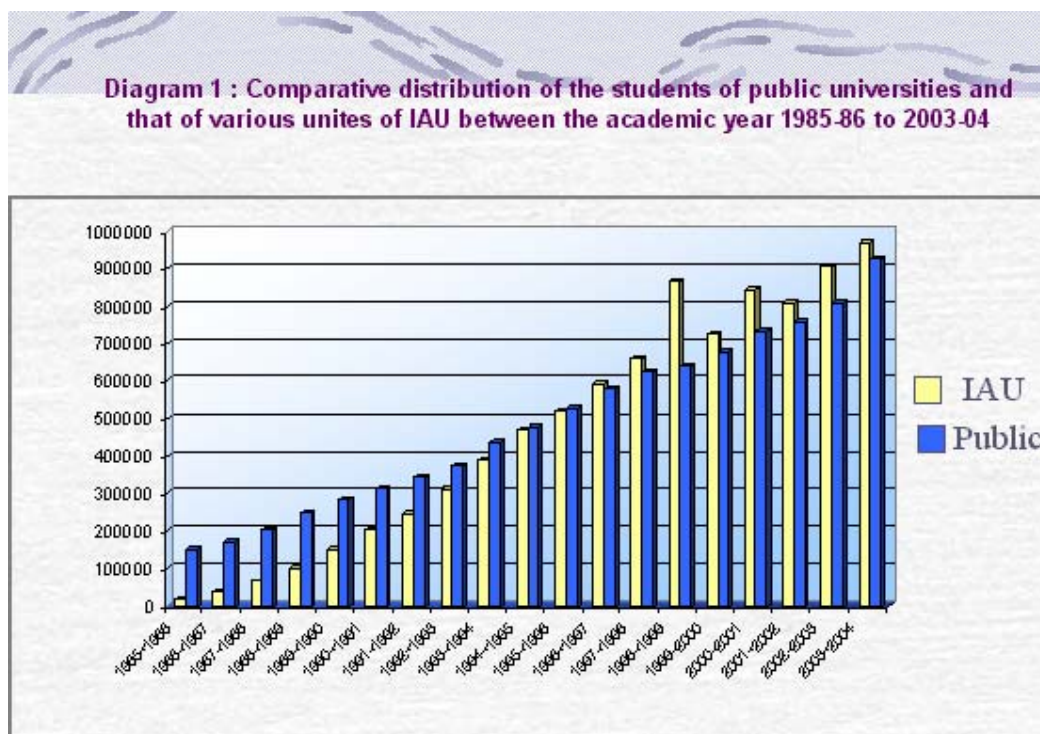


Table 1: Ratio of admissions to public universities and to IAU over the total number of candidates

Diagram I

Note: This diagram shows that number of students of IAU exceeds that of public universities

Diagram 2 : Comparative distribution of aggregate male and female students of public universities and that of IAU between the academic years 1985-86 to 2002-03

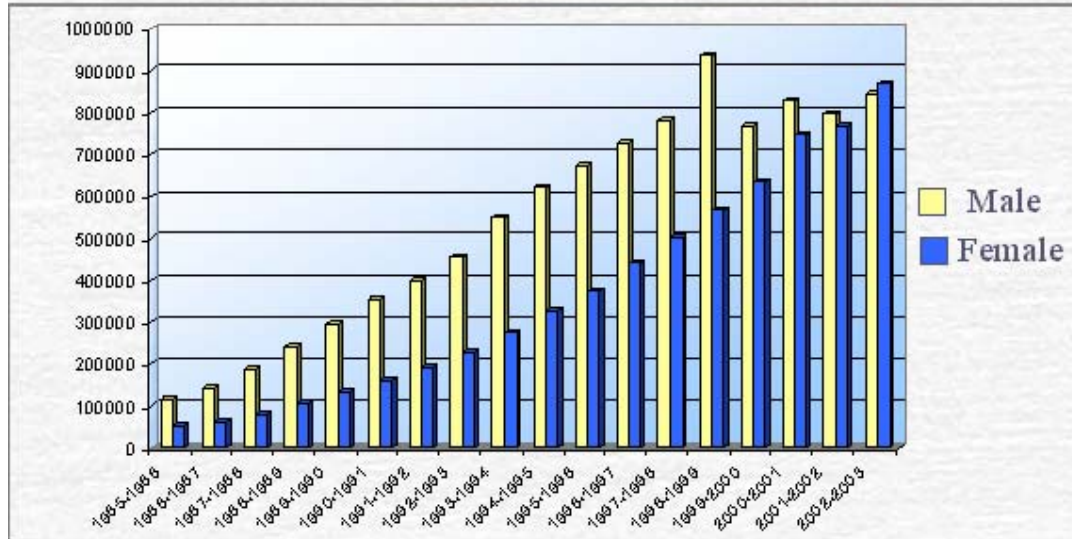


Diagram II

Note: This diagram shows how the balance between students of both sexes has developed since the establishment of IAU

Diagram 3 : Comparative distribution of the male and female students of public universities and that of various units of IAU in the academic year 2002-03

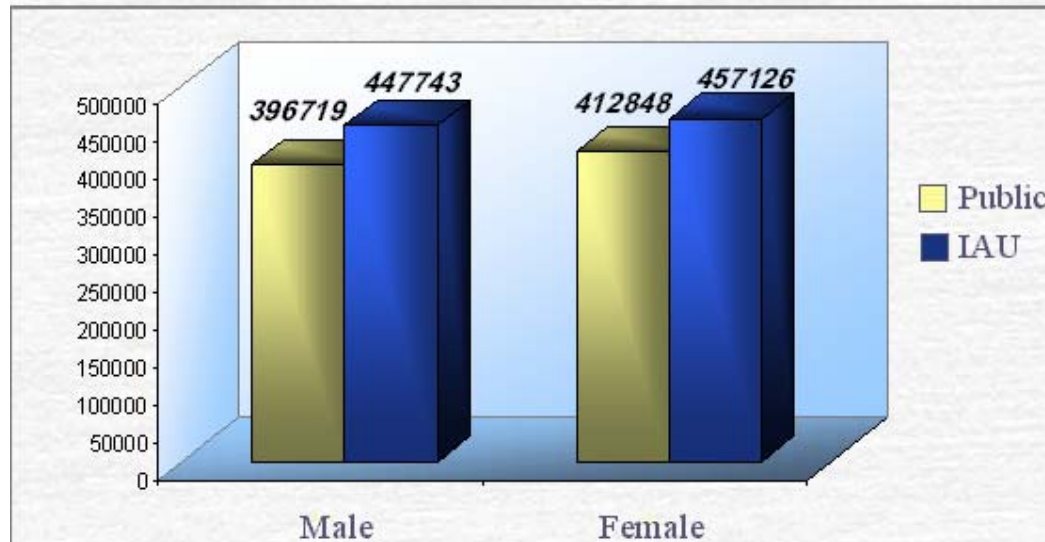


Diagram III

Note: This diagram displays that male and female students of IAU outnumbered that of public universities in 2002-03

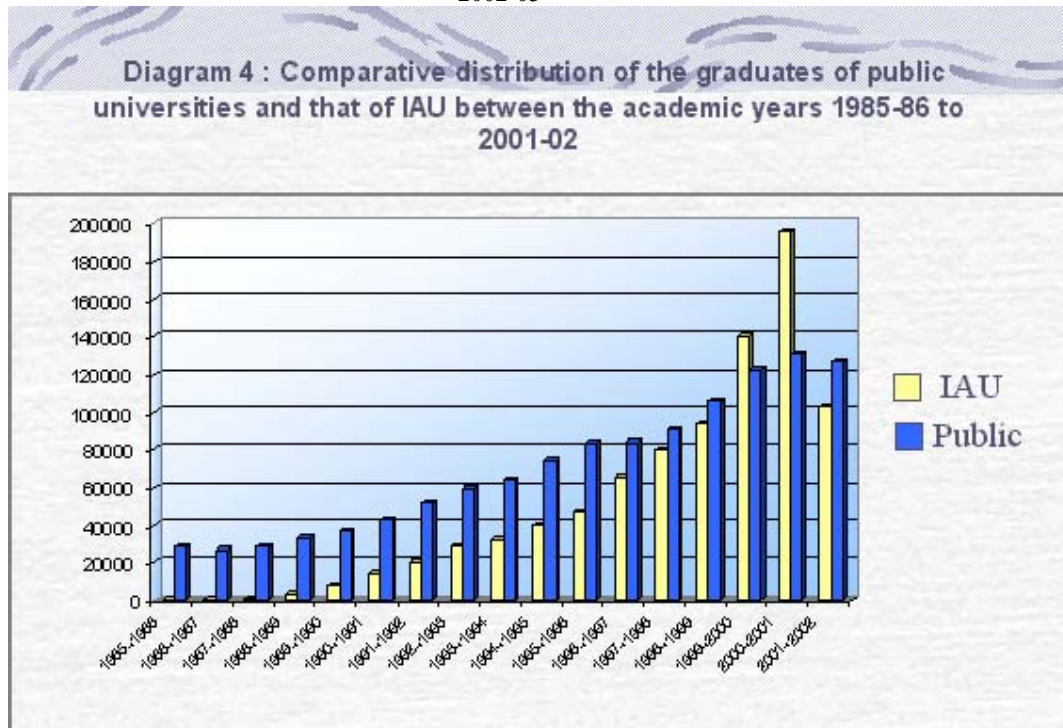


Diagram IV

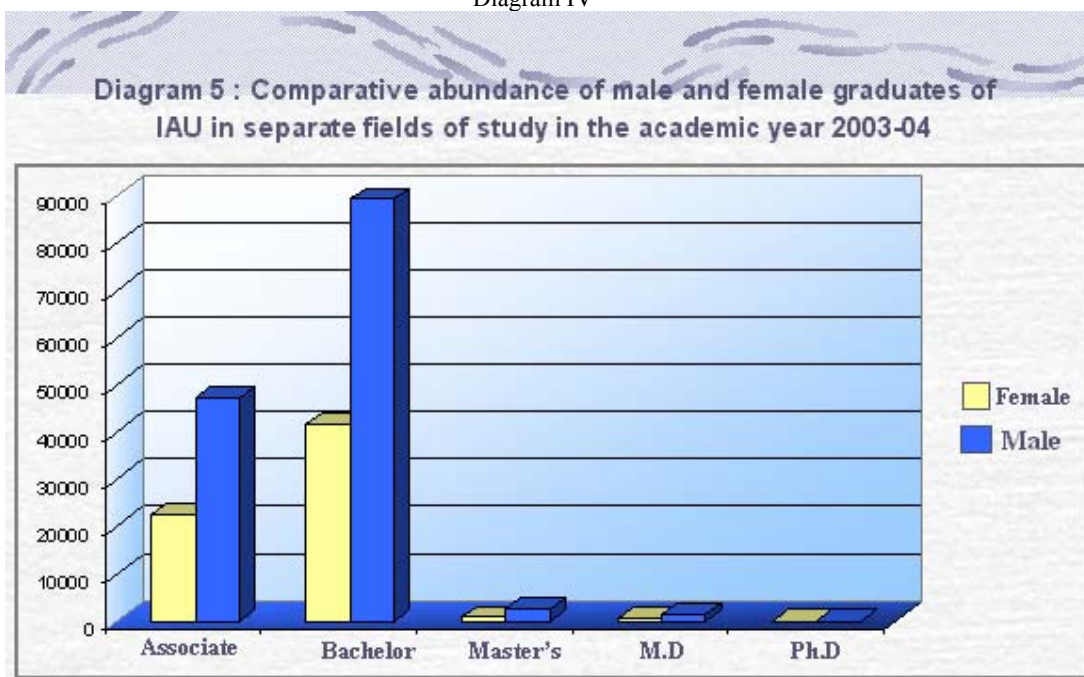


Diagram V

Note: This diagram shows that majority of graduates of IAU are in undergraduate courses

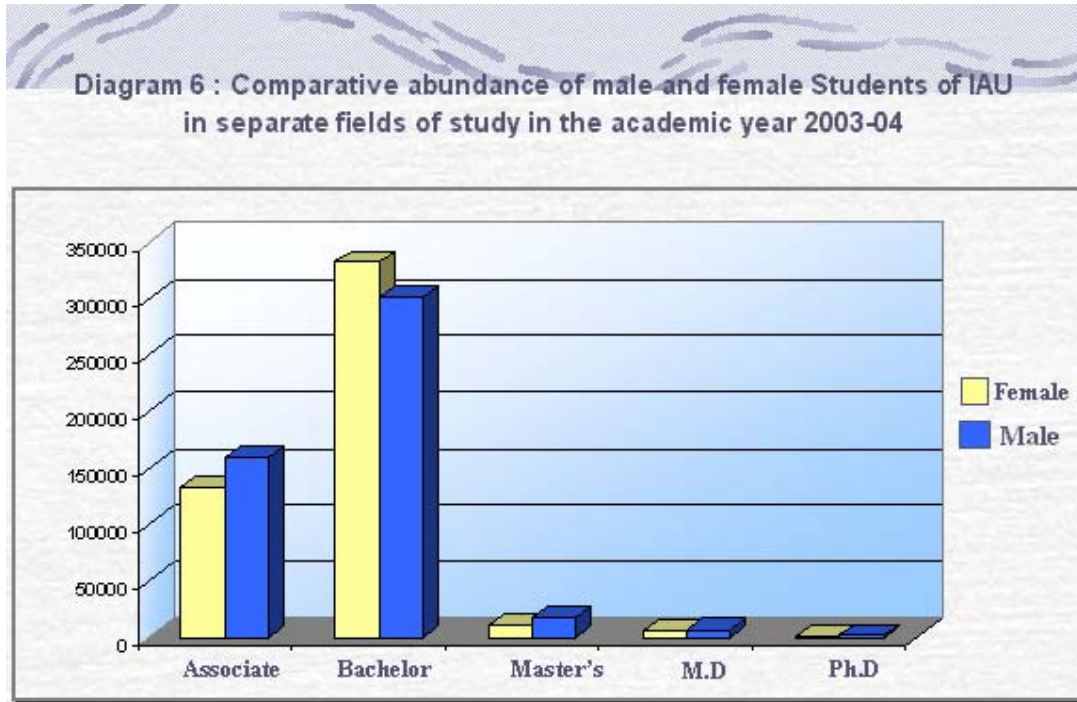


Diagram VI

Note: This diagram shows that majority of students of IAU are in undergraduate courses and female students in this field outnumber that of male students

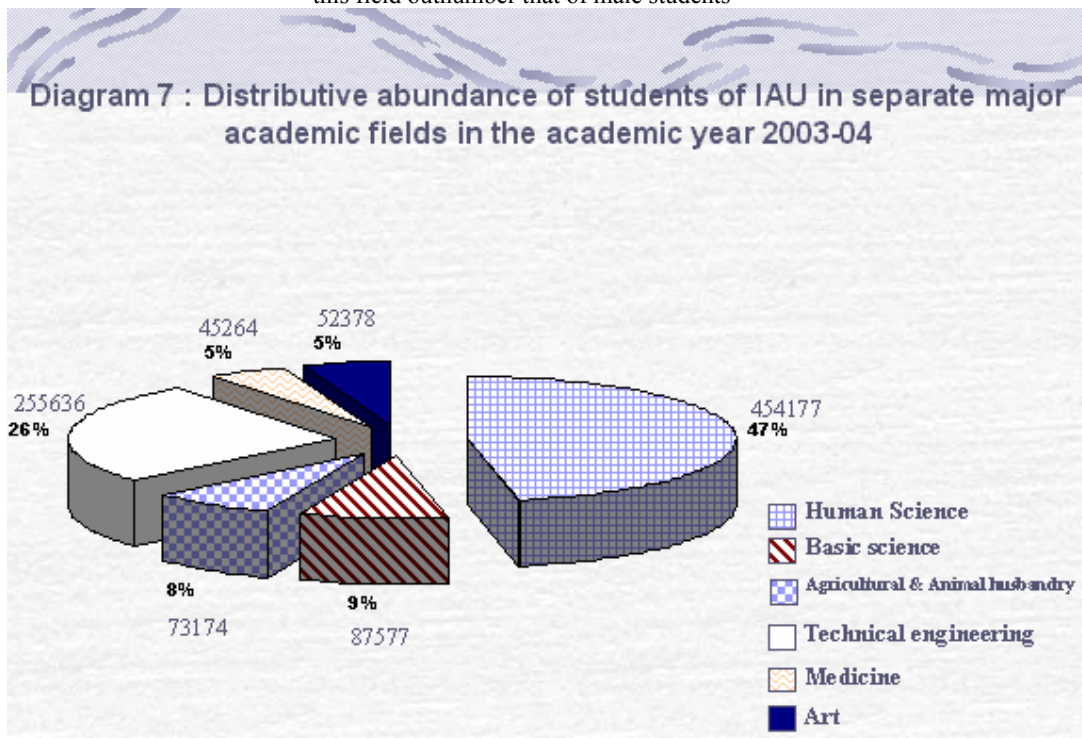


Diagram VII

Note: This diagram shows that majority of students of IAU major in humanities

In conclusion allow me to refer to the result of a research on the opinions of the professors of public universities regarding the function of their universities. To this end a questionnaire was distributed among 150 professors of the public universities seeking their views on the following points:

Questions:	%in favor
1. Has IAU caused promotion of knowledge and science in the society?	85%
2. Has the geographical distribution of various branches affected dissemination of science and culture?	80%
3. Has the IAU followed an appropriate trend of growth and development?	87%
4. Has the IAU presented a successful record in research activities:	60%
5. Has the IAU played positively in absorption of aptitudes, barring from brain drains?	79%

Conclusion:

As a successful experience in the expansion of higher education, IAU has registered a remarkable record, by creating a great cultural and scientific complex through private investment without any dependence on government budgets. Taking note of the role of higher education in development and productivity of human recourses, the function of IAU and its role in national development can be summed up as follows:

1. Procurement of skillful human resources for the development purposes of the country.
2. Enhancement of accessibility to higher education in the deprived regions, thus motivating low and middle classes of the society.
3. Increasing admission capacity to higher education as a step to accelerate improvement of higher education development indices in Iran.
4. Improving quality and productivity in the society
5. Utilizing capabilities of the country's workforce
6. Promoting the country's expertise capabilities
7. Increasing employment rates and jobs creation in the society
8. Creating economic momentum in small cities
9. Discouraging immigration of elite abroad
10. Allowing greater share to the students of graduate and post-graduate courses as the apt workforce for producing knowledge.