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Blended is Still Best: Review of Literature and Commentary on Optimal Learning Environments

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ABSTRACT

Blended learning environments are now the norm in most information systems schools. Blended learning environments are constantly changing as a wide array of technical and social influences bear upon our universities and colleges. This study describes a widely based literature review of the blended learning environment, particularly as it pertains to information systems teaching and learning as well as implications for information technology planning for universities. This literature review was used as a platform for further research where information systems students and staff were surveyed on their use and preferences of the mix of online and campus-based learning environments. Even pure e-learners and partial online students would still appear to prefer campus-based instruction, if possible, even while enjoying the convenience and flexibility of the online e-learning learning environment. The pure e-learning environment, campus-only instruction and blended learning environment literature is discussed and evaluated for its usefulness for an optimal blended information systems learning environment.

Keywords

Information systems learning environments, e-learning, blended learning environments, university strategy

INTRODUCTION

This review attempts to evaluate and discuss the literature surrounding learning environments particularly how it addresses the challenges and opportunities of the online learning environment alongside the traditional classroom environment and how this mixed-mode environment could be discussed and measured in terms of the learning environment in information systems. The literature combines e-learning articles, blended learning and the pioneering work of many in the general learning environment evaluation field. This literature review also serves as a background to the study of contemporary learning environments which includes online e-learning components as well as traditional classroom environments in the tertiary sector. The tertiary sector (an expression commonly used in New Zealand and Australia) referred to in this paper would include post-secondary higher education, both undergraduate and postgraduate. Some recommendations are made for information systems planning of learning environments while current and likely future blended learning environments are evaluated in the light of the literature discussed.

MOTIVATIONS FOR BLENDED AND ONLINE LEARNING ENVIRONMENTS

Many universities and institutes with little history in traditional distance learning programs are providing online opportunities for local residents, many of whom combine work, family, and education activities into their lives. For many modern students, the problem or barrier is not geography but time. As online learning matures, more institutes offer online courses and typically students enrol regardless of their physical distance or time constraints. Even full-time students who live on campus in dormitories enrol in online courses (Picciano, 2006). Some online courses are unsuccessful because of a lack of involvement by the teacher (Stacey & Rice, 2002). The web has also replaced, at least partly, the face-to-face component of teaching and learning. In some cases, the online learning environment has entirely replaced the face-to-face teaching delivery system and entire tertiary institutions are delivering programmes mainly in online or distance mode (Udas & Brown, 2005).

There is an acknowledgement that the physical campus should also adapt and change in conjunction with the changes in provision of online learning environments (Stacey & Gerbic, 2008). This concept broadens the change required to include larger classrooms with learning pods or break-out rooms which synergise better with other learning hours that are spent off-campus and online. There is still a need for teacher-student interaction regardless of the mode of delivery and motivation

factors are important to keep students engaged. Collins and Berge (1995) break down the tasks and roles of the online teacher into four areas: (1) pedagogical, (2) social, (3) managerial, and (4) technical. The pedagogical area can be described as the function and task that revolves around educational facilitation. Social function is a role associated with the promotion of a friendly social environment which is needed in the process of online learning, while the managerial components of online learning include setting the agenda, aims, guidelines and decision making norms. The technical aspect covers the teachers' skill in using the necessary technology for online systems. The teachers or lecturers in charge of an online course should make sure that they themselves are secure in their use of this technology to impart knowledge to their students (Chang, 1999).

A current snapshot of online education reveals a number of drivers: technological, higher education (qualification creep), globalisation, mass higher education, and increasing managerialism in higher education. A practically-based Bachelor of Information Systems qualification, for example, would be difficult (although not impossible) to place entirely online as practical laboratories and evidence-based systems need to take place in a controlled time and space (Skelton, 2008). The online learning environment invites different types of students with different motivations. "Many students see web-based learning as an opportunity for them to gain higher education without having to physically attend classes and academics worldwide have realized the attraction of this new learning mode" (Chang & Fisher, 2003, p. 3).

THEORETICAL DEBATES IN THE FIELDS OF LEARNING ENVIRONMENTS, E-LEARNING AND BLENDED DELIVERY

Most educational institutions at various levels are grappling with how the online learning environment 'fits' within their current organization in all areas; financial, marketing, educational quality and competition. The New Zealand government has recently been concerned about the financial nature, educational quality and authenticity of 'participation' of a number of popular flexible-delivery or online courses, for example free community computing, CD-ROM based computer training and free radio Maori language courses (English, 2006). Traditional public perception and political viewpoint still illustrates that the public expects that tertiary courses will require students to attend physical classrooms of some description and be accountable for their navigation of the course. The acceptance (or not) of e-learning as a valid "classroom" by the government and the general public will have an impact on an acceptable blended learning environment.

The blended and e-learning environments depend heavily upon constructivist frameworks. However constructivism should not be interpreted to mean that the teacher can leave the learners to explore purely by themselves. As with blended environments, scaffolding, coaching and modeling are needed to keep student learning on task (Khine, 2003). The evolution and growth of constructivism combined with the advent blended learning systems have created an even stronger argument for appropriate support for the learner lest they be left stranded by both constructivism and technologically-delivered learning systems.

Some studies have attempted to evaluate online courses with traditional courses. However, it is questionable whether the comparison between face-to-face education and online education is still a valid comparison. Are we still measuring all new forms of education by the older traditional framework? If we achieved distance education as good as face-to-face would we then say online/distance education had achieved full success? Potential deficiencies in the traditional university and tertiary learning environments may include a lack of full preparation of course material by lecturers, lack of personal communication with students when class sizes are large, and a sense of bureaucratic isolation by the student (McDonald, 2002). The arguments for and against online learning models are extensive and also have an impact on the accreditation of an institution's programmes. An institution may integrate online components within an already accredited programme, but if the institution offers a pure online e-learning course then special accreditation may be necessary (McDonald, 2002).

THE LEARNING MANAGEMENT SYSTEM

There may be some dangers in over-dependence on the learning management system (e.g. Blackboard, Moodle, WebCT) for all knowledge delivery. Passive learning should not be the primary model for collegiate business education. Lecture slides, absent of any additional interaction, are simply a form of information delivery (Grandzol and Grandzol, 2006). Traditionally a teacher integrated several activities performing course design, materials preparation, lecturing and tutoring, assignment marking and assessment but now these tasks are being unbundled. The physical campus of the university is now in question as technologies create the potential for higher education to develop as an intellectual or virtual space (Department of Education, Science and Training, 2002).

Funding for the university or tertiary institute is often dependant on institutions proving that the declared students enrolled and did attend or participate authentically in the course. This funding dependency requires any tertiary institute to provide mechanisms that allow evidence, for example through email or participation in online discussions, that the enrolled students did engage throughout the course (de Freitas & Oliver, 2005).

BLENDED DELIVERY ISSUES

Lecturers in the mixed-mode environment have demands from students in the bricks and mortar classrooms as well as from the online systems. In some cases these online and offline demands may come from the same students, while some online demands may arise from students who are enrolled largely off-campus. Activities such as checking email and online discussion groups must be conducted with far greater frequency than the weekly lectures and tutorials. When demands for assistance are made by students, they need to be acknowledged and addressed promptly, and this can disrupt the normal pace of interaction between teacher and students (Downes, 2006).

Ellis and Phelps (2000) warn that an online presence and blended delivery requires an examination by teachers and entire faculties of maintenance and updating problems, the expectation of teachers by students, and the emphasis given to online content and communication. It is also useful to view the various learning environments in the context of the type of student. Students may be enrolled as full-time on-campus, part-time on-campus, full-time online, part time online only, block mode on-campus with some being a mixture of these student modes (Picciano, 2006). This consideration would suggest that the overall teaching load is more difficult to accurately ascertain in the blended environment compared with the traditional course, where the availability of a teacher for specific timetabled periods would normally suffice for the creation of viable learning environments.

Universities are now re-examining their teaching practices and balancing of timetables. This re-examination includes reducing the number of contact hours per week for a standard undergraduate course and substituting online activities and content for some normally timetabled classes. This blending of Internet and information technology with traditional campus strengths, such as research and the challenge to students to perform critical thinking, needs to be thoughtfully designed, planned, and implemented (Calgary-University, 2007).

Hybrid or blended learning environments seem to be less controversial than pure e-learning courses and less likely to be resisted by academic staff in the tertiary sector (Young, 2002; Bonk, Kim and Zeng, 2006). Many faculty believe that the physical teacher relating to the student via campus classes and personal mentoring is still the simplest and least expensive method of establishing a relationship with the student (Fungaroli-Sargent, 2000). The pure e-learning proponents may now acknowledge the merits of a blended approach as the pure e-learning model has not been as widely successful as first predicted. This adapted approach towards blended learning rather than e-learning alone has been less visible and most tertiary institutes are quietly working on converging online and on-campus classes without great publicity. One study in a number of Taiwanese schools found a direct correlation between student satisfaction in the real-world classroom and enjoyment of the associated web-based learning implying that the right 'mix' can be particularly satisfying for students (She and Fisher, 2003). There appears to still be a role for the lecturer to teach and entertain us in the classroom conveying enthusiasm, expert knowledge, experience, and context (Bersin, 2004).

Interestingly, students appear to appreciate the campus classes more when they occur with less frequency within the blended learning environment. These experiences seem to show that pure face-to-face courses are not necessarily the best environment, or that face-to-face environments are the standard by which all other learning environments are judged. The particular mix of online and traditional elements may be at different levels for different courses. This flexibility of deciding the effective mix can be accommodated by still allowing academic staff full control over their particular courses (Young, 2002).

THE INFLUENCE OF PEDAGOGY AND THE MODERN MEDIA

Institutes are making decisions about blended learning for pedagogical reasons also, trying to capture the best of online and traditional face-to-face modalities (Picciano, 2006). The reasons for the setting up of blended learning environments has not always been to create greater access, but rather to create the best mixture of online and face-to-face elements of the overall learning environment. For example, a degree in computing may offer six papers purely online, while the rest of the degree may be offered in a primarily campus-based blended delivery mode (Pascoe, 2007).

The incorporation of online learning does not rule out the importance of face-to-face interactions in any teaching and learning situation (Quek and Wong, 2003). Optimal mixtures of traditional and e-learning technologies may be related to ideal mixtures of teacher-led and constructivist teaching approaches. In learner-centred learning environments, the technology may facilitate communication, collaboration, and e-learning with likely assessment to include portfolios and performance-based assessment items. This association between teaching philosophy and use of technology-enhanced learning environments may be useful when constructing a set of goals for future blended learning environments (Mumtaz, 2000). Teachers may also need to re-examine their traditional timetable and contact hours, classroom practices, and student interaction to accommodate the new blended learning environment.

The idealised tertiary learning environment should be viewed in the context of the online and media-immersed nature of modern life, particularly for the younger tertiary student. The typical tertiary student is influenced by many non-study hours such as; using the Internet for social networking, television viewing, cell phone communications and ipod delivered music. The classroom, in all its forms, is competing for attention and satisfaction amidst this background 'noise'. Lecturers faced with students expecting and insisting on entertainment can be aided by the concept of the carefully crafted blended environment where Internet-mediated discussions, online coursework and vibrant campus classes can give students the sense of immersion in a modern responsive learning environment (Joyce, 2006).

The social networking phenomenon taking place on the Internet will continue to influence web-based learning environments with the ability of students to upload photos, assignments and general comments in a merged environment with the social internet sphere and the working/studying internet environment overlapping. Nash (2007) discusses the potential influences of the celebrity news and social networking sites on the e-learning environment. Online and blended learning may need to be planned as co-existing alongside fast-moving and influential social phenomenon within the overall Internet environment.

HISTORIC AND TECHNOLOGY ISSUES

The integration of technology has been an issue in education well before the contemporary use of more sophisticated e-learning systems. Oblinger and Rush (1998) predicted a decade ago that tertiary education faced the challenge of creating a future compatible campus as technology trends disintermediate the traditional provider of learning and student services. This ideal of a future compatible campus proposed a robust yet flexible information technology infrastructure which would be agile enough to accommodate flexible learning environments, strong IT systems, and adaptability by tertiary staff (Anandam, 1998).

Investigations into the use of computer laboratory classroom environments (Newby & Fisher, 1997) and studies of computer-facilitated learning environments (Bain, McNaught, Mills, & Lueckenhausen, 1998) have shown positive outcomes for students utilizing these IT-based learning environments developed in the 1990s. These historic issues, of implementing internal IT environments, have largely been dealt with successfully over the last 10 to 15 years by tertiary institutes. This historic era, although only a few years ago, illustrates that the integration of technology has been addressed before and can achieve successful outcomes for tertiary institutes (Anandam, 1998).

However, there are a number of issues and limitations of the traditional learning environment. One limitation is the lack of scalability as large or very large classes are very difficult to deliver. Another problem is the time period of duration of a particular course – teacher-led courses normally have a start date and a finish date with little flexibility of speeding up course duration or completion dates. Technology can theoretically extend the instructor model in space and time (Bersin, 2004).

INSTRUMENTS FOR EVALUATING THE ONLINE LEARNING ENVIRONMENTS

Chang and Fisher (2003) outlined the rationale for conducting research into the social and psychological aspects of the online learning environment in the context of the growing use of Internet mediated learning and teaching. They also undertook studies to focus on the online learning in tertiary education and sought to measure its effectiveness as a learning environment.

The web-based learning environment instrument (WEBLEI) survey instrument attempts to comprehensively assess online learning environments for tertiary education and this instrument went someway to address the lack of research into the psychosocial view of online learning environments. Their study recommended that the online learning environment should be seen more holistically than merely a vehicle for desired distance education (Chang and Fisher, 2003). Given the number of different factors constituting the overall learning environment, then the research instruments should attempt to evaluate as many of these factors as possible (Chandra & Fisher, 2006). Further blended environment research using the WEBLEI instrument and utilizing the theoretical platform from this literature review has been undertaken by the author with some results already published.

FLEXIBLE DELIVERY AS AN ALTERNATIVE CONCEPT

Alternative studies evaluating non-traditional courses have focused on the 'Flexible-Delivery' course incorporating the concept of accessibility any time and anywhere, and imply a multiplicity of media from traditional paper-based workbooks to DVD's, websites, audio and video. The ideal flexible environment is also seeking the right balance between face-to-face communications, interaction via other media and individual work so that each learning experience is maximized (Quinton, 2006).

There are many instances in the blended learning environment where the lecturer may be comfortable doing something face-to-face and it works well, but there may be aspects that can be beneficially translated into the online environment (Picciano,

2006). In one course, blended learning may be used to enhance the traditional lecture with electronic instructor notes, additional readings, and images of charts, graphs, or other handouts. In another course, online learning may be combined with face-to-face instruction so that rather than meeting in a classroom three hours a week, a course meets two hours per week with the third hour consisting of an online threaded discussion.

Another study discusses some of the economic motivations of the tertiary sector for entering the e-learning and online course delivery relatively quickly. High levels of employment (until 2008) and the diminishing enrolments into tertiary education generally have provided incentive for tertiary institutes to implement more flexible learning options. E-learning courses, it is thought, should provide enough flexibility to allow those in full or part time employment to continue with professional development, without the need to attend on-campus classes (Pascoe, 2007).

Pressure to move towards online courses as an alternative is often driven by management however there is often some resistance from academics as lecturers are reluctant to leave the familiarity of the classroom or lecture theatre. Academics' general information technology skills may not be fluent enough to easily learn configuring and adding content to a learning management system (Pascoe, 2007). These issues need to be taken into account when the decision is taken to change existing courses towards online versions. Academic managers seem to hold a widespread belief that e-learning environments can reduce costs of buildings, campus resources, travel, and academic remuneration. For most universities however, the longer time required to develop good quality, responsive online and multimedia resources often impede any prospect of cost saving, and often generate higher workloads for teachers and managers in the tertiary environment (Navarrette and Guthrie, 2008). In the experience of some tertiary institutes, the attempted initiation of online web-based learning systems results in a higher comparative cost for courses and no guarantee of a return on investment (Wheeler, 2006).

THE EFFECT OF EMERGING TECHNOLOGIES ON THE ONLINE LEARNING ENVIRONMENT

The online environment is changing quickly and constantly with Web 2.0 technologies and virtual realistic environments expected to cause another wave of Internet influenced features. Chard (2006, p. 609) describes the virtual environment in the context of the web having "developed from an information publishing space to an interactive communication space". Authors of educational media are now beginning to investigate utilizing the three dimensional interactive virtual online environment which was originally developed by the gaming development community (Squire, 2003).

This emerging technology takes the potential online learning environment to the next level with the student experiencing a fuller immersion while utilising online resources. The issue of the balanced blended learning environment will remain however, as it is unlikely that the enrolled tertiary student will spend their entire learning time and classes within the virtual online environment for the duration of the course. One issue with the use of technology such as Second Life may be the difficulty of the learner-participant switching from the online environment to the real-world environment. This transition may be more difficult with the use of systems such as Second Life (Chard, 2006).

There are some technical infrastructural problems with leading-edge e-learning features. Ironically, the tertiary institute may be unable to provide the Internet and IT access for the advanced features offered on leading edge online systems. In order to secure an internal university network, often the Internet access is limited with filtering on video and audio files, restrictive bandwidth, and generally restrictive proxy Internet settings. This may have a negative impact on students who may be studying on campus from the library or computer rooms set up for flexible learning. Many students will have broadband Internet access at home however, so will not experience the same potential restrictions in their home environments (Rickards, 2003).

Huang and Tan (2003) describe another set of emerging technologies with the growth of handheld devices incorporating cell phone, wireless Internet connectivity and small-scale software applications. This technology may have an impact on the conventional computer classroom or laboratory. "No longer do we need to 'go to the computer lab' where tables and chairs are 'rooted' to the positions in a rigid manner" (Huang & Tan, p. 396). In this scenario, the traditional on-campus experience may change to a more fluid and flexible arrangement with the possibility of students supplying the 'workstation' and the tertiary institution supplying the IT infrastructure.

BLENDED EXAMPLES FROM E-BUSINESS

The concept of blended models of delivery can be also found in cross-industry examination (Jelassi & Enders, 2005). The news media is now broadening its audience channels by combining traditional media such as television and newspapers with online channels such as news websites and the use of social networking websites. How this newly emerging e-business blended model will develop is not clear, but traditional media is still strong and is actively influencing the e-business channels and vice-versa. Other industries where the online channels are becoming very successful also demonstrate that the

bricks and mortar segments are still popular long after the online success. These other examples would include Barnes and Noble which is a significant online book seller globally, but still maintains a successful network of 'bricks and mortar' book stores. The success of eBay, and in New Zealand, Trademe.co.nz, have seen the phenomenal rise of consumer to consumer e-business, but traditional physical auctions, classified advertising in newspapers and buyer guides are still providing viable marketing for consumers.

These examples of blended business models from other industries combining e-business and traditional physical business channels help to illustrate the possible directions of tertiary education. The pure e-business models are likely to be successful for only a few large players, for example Amazon and, in education, a few large online globally positioned universities. For most businesses and organizations, e-business is being integrated into their overall business channels and environments and this is likely to be the case for tertiary institutes as well (Jelassi & Enders, 2005).

LITERATURE REVIEW SUMMARY

This literature review has provided a theoretical framework on which a larger study on optimization of blended learning environments has built upon. This review of learning environments for a mixed-mode (e-learning and traditional) learning environment for a tertiary institute or university has outlined some of the issues in this field, in pure e-learning, in blended delivery models, and in the general field of learning environments.

This review is distinctive in the particular combining overview of online e-learning developments affecting the learning environment, the traditional physical classroom learning environment, and the historic measurement of these two different environments. The literature reviewed has attempted to strike a balance between pure online e-learning environments, physical learning environments and mixed-mode environments. Effectively, most tertiary learning environments are now blended environments, lying somewhere on a graduated spectrum, and so it is useful to consider a wide range of literature in the learning environment field rather than just the emerging technological innovations.

FURTHER RESEARCH

Further research will be published from a larger research project relating to this literature review involving an extensive survey of tertiary students and staff about their perception and experience in various blended learning environment using the WEBLEI instrument (Chang and Fisher, 2003). Qualitative data was also gathered from extensive interviews with university staff in the business and information systems fields. A preferred model of optimal blended learning environments based on all the strands of this research will be described and proposed from this research.

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