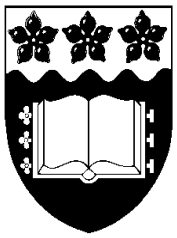

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Exploring student engagement for Generation Y: a pilot in Environmental Economics

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This paper reports on a pilot study involving the redesign of a third year Economics subject according to principles of engagement as they relate to the discursive Generation y student. The study involved a review of the literature, redesign of the subject to a blended learning format and evaluation of the design. The data collected included pre and post NSSE scores, subject grades, student surveys and qualitative feedback from individual students. While the redesign of the subject was constrained by available resources, and the implementation hindered by various systemic factors, it was found that in general the redesign did improve student engagement. In particular, it was found that the success of the scaffolded assessment tasks and the use of in-class activities as a means of revising for exams was significant. One issue that continues to perplex is the students' mixed attitudes to attending lectures. Perhaps most importantly, the study indicates that by third year where traditional modes of teaching have characterised their curriculum, students have developed surface approaches to learning that cannot be corrected through individual third year courses.

Keywords: student engagement, elearning, generation y

Introduction

This paper reports on the redesign and evaluation of a third year Environmental Economics subject aimed at improving student engagement. The project emerged out of the subject coordinator's growing concern about the students' lack of engagement with the subject's content at a time when environmental issues were experiencing increased public importance. She perceived that while students were still achieving reasonable grades and passing exams and the subject was achieving average levels in annual evaluations, they did not appear to appreciate the deeper social implications of the material being presented, did not seem to be able to apply it to situations other than those covered in class, and could not relate it to practical or policy situations in the real world, even though such issues were incorporated in the ongoing assessment activities of the subject. While the lecturer was expecting the students to apply deep learning practices to the subject material, her students appeared to take a surface learning approach, memorising enough of the material to pass exams and get their degrees. Although various interpretations were offered by colleagues, the most common response was to blame the availability of online materials for lecture absenteeism. The subject lecturer sought to reframe the problem as one where perhaps the traditional style of teaching in universities no longer meets the needs of 'Generation Y' student learning. In a search for better understanding of how we might engage a new generation of learners, this paper reports on a study that sought to engage with the literature on 'Generation Y' student learning, redesign a subject in

light of this literature, and evaluate its effectiveness with some reflection on the literature. A variety of evaluation techniques were used as discussed later in this paper.

The Subject

Environmental Economics is a third year elective subject in the Bachelor of Commerce delivered across the 6 campuses of a regional University. The content is 'economic' in the sense that it is based on microeconomic theory (both neoclassical external cost theory and ecologically sustainable development theory), uses economic logic in addressing environmental problems (particularly a benefit versus cost or net benefit perspective), and develops a number of methodologies that can be used to measure environmental costs in practical situations. The content also includes non-mainstream economic elements such as a discussion of the various paradigms found in environmental studies and historical approaches to the environment, including steady state economics, developing country issues and biodiversity. The theoretical level of the subject is not high requiring only first year microeconomics as a prerequisite. It is non mathematical in approach.

The subject was traditionally delivered via a two hour lecture and a one hour tutorial. Because the subject was delivered across the satellite campuses, it had already made some shift towards a blended learning model by streaming lectures for remote students, providing an eLearning space for subject content and videoconferencing a tutorial across sites. In general, however, the original design conformed to traditional higher education delivery.

The literature

According to the literature, Generation Y students, defined as being born from 1985 and exposed to information technologies and computers throughout their secondary education, differ significantly from previous generations of students (Generation X and Baby Boomers). In particular, they are characterised as being less independent and more in need of structure to their learning, are highly sociable and inclined to group rather than independent learning, will rely heavily on the internet and other electronic resources unless directed elsewhere, are trusting of authority, traditional institutions, parents, political leaders, etc., and will accept rules and supervision if clearly laid out. This student body is also racially and ethnically diverse (Krause (2005). Although these kinds of generalisations can be as dangerous as they are helpful, they paint an interesting picture for University staff grappling with engaging a new generation of students.

The objective of subject design is to create content, materials and activities that will stimulate student learning skills in order to achieve specified student learning outcomes. Twenty-first-century learning skills include the following: information and media literacy; critical thinking and systems thinking; problem identification, formulation, and solution; creativity and intellectual curiosity; interpersonal and collaborative skills and social responsibility (Oblinger 2005). The desired learning outcomes in this case were to improve students' engagement with their subject matter

as outlined in the introduction to this paper. Learning styles are the way students concentrate on, process, internalise, and remember new information. Carver and Cockburn (2006) provided the following perspective on Generation Y student learning styles as being:

> **Technology-driven -** Engage better with materials anchored in their own experience and possess greater potential for deep learning if allowed to study on their own terms as to time, place and pace. Thus they relate to the convenience and flexibility of an online teaching environment. It is the activity enabling feature of technology that makes online learning attractive by making it more interactive, social and student centred.
>
> **Experimental -** Prefer active learning activities that encourage them to construct their own 'learning by doing', rather than being told. A discovery approach to learning increases information retention and student participation by reducing opportunities for boredom. Nevertheless a balance needs to be maintained between process and content (lecture materials).
>
> **Structured** - Prefer a scaffolded and structured teaching and learning environment. Learning materials associated with online tasks must be 'bite sized', via a step by step approach to make them more manageable. Feedback and monitoring by instructors fulfils an important supportive and motivational role.
>
> **Collegial** - More likely to make decisions based on collective experience of their peers rather than their teachers. Teamwork approaches improve student relationships, social skills and psychological development as well as academic learning and retention, cognitive development and active engagement. It provides discussion in which conflicting perceptions arise, and are reconciled, criticized, resolved and reformulated by exposing and modifying inadequate reasoning and constructing new knowledge. Teamwork, communication and leadership skills are developed through collaborative learning, even when conducted online.

The literature on Generation Y learning indicates that there is a close correlation among their learning style, 21st century learning skills and deep learning processes (Barber 2007; Carver and Cockburn 2006; Goldgehn 2004; Krause 2005). Thus taking these learning characteristics into account, the redesign process aimed to create a set of activities and a content delivery system that would stimulate a deep learning process in these students in order to improve learning outcomes.

Deep Learning is learning that promotes the development of meta-cognition through a process of inquiry and reflective thinking. Educators need to incorporate deep learning and real world applications into online courses to facilitate meaningful discourse and dialogue (Craig and Patten 2006). Students who are deep learners want to develop a deep understanding of the subject and different ways of thinking about it and are less enthusiastic about formal lectures. It often involves informal learning which takes place outside the classroom, is largely self-directed and internally motivated, unconstrained by time, place or formal learning structures. It is often facilitated by technology and emerges from the interaction of people (Oblinger 2005).

There are several ways of inducing deep learning within a subject design. These include experimental learning, problem based learning and collaborative learning, which are often referred to as active learning techniques (Weiler 2004). Deep learning is associated with experiential learning involving a process through which a person experiences an event, acquires competencies and compares that knowledge with knowledge gained elsewhere. It uses active learning techniques involving dialogue, debate, writing and problem solving as well as higher order thinking: analysis, synthesis and evaluation (Barber 2007).

Problem Based Learning (PBL) is self directed learning in collaboration and in a context. It involves a shift from teaching to learning where students become active learners. PBL results in the following outcomes: enhanced problem solving abilities; increased knowledge retention; better cooperation; challenging thinking; open to new ideas; stay on task; develop organisational skills; respect for peers; independent learners. This process is paralleled by a rapid shift to web-based courses for both on campus and distance learning and combinations of these (Wretlind, et al. 2007). PBL has also been defined as a constructivist approach that requires learners to construct and develop their own knowledge through researching and developing solutions to open-ended, real life problems. Collaborative Learning occurs where students work together and knowledge is socially constructed. It supports the transfer of responsibility to students while developing important workplace skills such as discipline-based communication and the ability to work in teams (Allen, et al. 2006).

However, not all students will respond to active learning techniques, which tend to favour those students with visual-spatial or body-kinaesthetic intelligence styles. Students with verbal-linguistic or logical-mathematical intelligence styles may favour traditional educational delivery (Weiler 2004). Critics of traditional educational delivery argue that it can be associated with surface learning. Students who are primarily interested in knowledge acquisition and a surface approach are more inclined to favour lectures. Students using the surface approach prefer a ready link between the material taught and fact-based assessment procedures. While lectures are an effective method of transmitting information, they are not as effective in promoting thought, teaching values associated with the subject, inspiring interest in the subject or teaching behavioural skills. Lectures are considered a poor method of developing thinking skills or the formation of attitudes due to the lack of involvement by the students who remain passive recipients of information (Barber 2007).

Based on the above profile of the learning characteristics of Generation Y students, the pilot subject, Environmental Economics, was redesigned to encourage a deep learning process among its students. The pilot was extensively evaluated after its first session of teaching.

Redesign

The redesign process was overseen by a project team comprising the subject lecturer and representatives from Learning Development, the Centre for Educational Development and Interactive Resources and the Library. Based on the findings from the literature review, the subject for 2007 delivery was redesigned as a blended elearning subject involving:

Changes to lecture and tutorial

The traditional two hour face to face lecture was replaced with a modularised audio recording of the lecture uploaded on the subject's eLearning space. The two hour lecture was broken into three or four topic modules, to segment the online content into more digestible 'bits'. This change provided students with greater flexibility to study at their own time, place and space, while retaining the lecture format as an efficient means of delivering the subject content (Allen, et. al. 2006). Online delivery was also thought to be preferred by 'English as a second language' students (Aviles, et al. 2005). The traditional one hour tutorial was lengthened to a two hour face to face seminar. This seminar was used to provide personal contact with the instructors in an informal format. It also facilitated student collegiality (Carver and Cockburn 2006, Barber 2007).

Activities for each lecture module

A set of activities was developed for each lecture module. These activities were designed to provide the student with a means of ensuring that they understood the concepts in that module and encouraging active learning through independent research about a concept (e.g. a web search) or by applying it to a different, familiar or topical situation (e.g. identifying an appropriate local problem or a current affair). Students were asked to bring their answers to the seminar for review. No marks were associated with these answers. However, students were told at the beginning of the course, and reminded half way through and at the end of the subject, that exam questions would be based on these activities. This occurred. Thus undertaking these activities provided a set of notes that could be used to revise for the exam. The activities were designed to encourage experimental and action based learning whereby students could investigate issues independently thus deepening their understanding of these concepts (Craig and Patten 2006, McClelland 2006, Barber 2007).

Changes to the subject eLearning space

The Subject's eLearning site contained (i) teaching materials comprising the audio lectures, slides and seminar activities for each week; (ii) resources comprising ereadings, information literacy instructions for the assessment tasks, and a page containing recent reports relating to local, national and international environmental issues; (iii) group work support including lists of seminar participants and a separate discussion space for each group. It also contained guidelines on how to use the space for the online learning elements of the subject. The site redesign provided students with a range of online resources for both immediate assessment tasks and to extend their knowledge of environmental policy issues if desired. It was designed to meet student preferences for online resources but also supported interaction among group members (Krause 2005, Carver and Cockburn 2006, Lisi 2006, Smith and Brown 2005).

Scaffolded assessment tasks

Previously, ongoing assessment had involved an essay on the benefits and costs of a 'real world' industry generating pollution and a report and presentation on one of four elements of a benefit – cost investigation of a current major environmental issue. This was changed into a more structured and 'scaffolded' set of four tasks based on significant content elements in the subject. Again practical or real world applications were used in each task. Students wrote a short report for each task, which were marked and returned with a one week turnover. Students also did one class

presentation based on one of these task reports, which received a small mark. The final exam remained at 50 per cent of the total marks. However, students could elect to substitute half the exam for a 'research and policy' essay (25%) based on a current environmental issue. Scaffolded tasks were used to meet students' preference for structured learning and continuous instructor feedback, as well as retaining 'real world' applications of the subject's conceptual content (Carver and Cockburn 2006, Craig and Patten 2006, Aviles, et al. 2005, Hughes, et al. 2006).

The introduction of group work.

Previously, the seminar program had involved reports on four perspectives on current environmental issues so that groups of students focused on each issue, although all assessment was on an individual basis. Thus, no actual group work was involved. In 2007, groups of four students were developed based on arbitrary assignment. The purpose of this process was to encourage students, who may not have known each other before the class, to work together. Groups worked together to allocate topics for each task, but the reports were written and handed in individually. Each student took a turn at being group leader for one task, and received a small mark for this role. The group leader's only responsibility was to ensure each student had a topic for each task, to post these topics on the group discussion space, and to email these to the tutor for perusal and approval. Students were asked to post a draft of their task report onto their group discussion space for other students to comment on and provide advice on improving it if appropriate. This process was only intermittently monitored by tutors. The purpose of the group activity was to encourage teamwork, communication and leadership skills through collaborative learning (Carver and Cockburn 2006). The arbitrary allocation of students to groups was to encourage stronger student engagement through enhanced collegiality and particularly to encourage 'English as a second language (ESL)' and foreign exchange students to interact with local students (Zhao, et al. undated). It is argued that student engagement is particularly linked to learning outcomes such as critical thinking and grades, although the relationships were not robust (Carini, et al. 2006).

The Introduction of computer laboratory sessions

Computer laboratory sessions were introduced for the first three weeks of the seminar program. These sessions had three main purposes. Firstly, they introduced students to the elearning site, and showed them how to use it to support the online elements of the subject (Steiner and Segal 2004). Secondly, they showed students how to access databases which contained information relevant to environmental economics for use in their tasks. Specifically, students were given practical exercises to access the ABS Census data for their local area, and also to see the range of data available on environmental issues. They also accessed the NSW Department of Conservation and Climate Change site for data on pollution licences and endangered species. Data collected in these laboratory exercises were used in their assessment tasks (Meyer and Nulty 2002). Thirdly, the exercises were designed to demonstrate the relevance of their studies to the 'real world' and provide them with relevant future work skills (Lisi 2006, Hughes, et al. 2006).

A number of ideas identified in the literature review were considered but not introduced in these revisions, partly due to resource (time) constraints but also to allow a staged introduction and evaluation of the revisions. The ideas omitted

included the inclusion of more visual and multi-media elements in the power point slides[1] and the inclusion of more intensive group work assessment tasks[2].

Evaluation

At the end of Spring session 2006, an evaluation of the subject under traditional delivery mode was conducted. The baseline data consisted of a set of Likert scale questions on student engagement adapted from the student engagement survey run in the USA (NSSE 2006), as well as an analysis of past subject evaluation scores and grades. In 2007, the new delivery mechanism was also evaluated. The 2007 evaluation included: the student engagement survey results, student surveys of subject design, subject evaluation scores, an analysis of student grades and debriefing sessions with the students and the tutors. The results were extensive and cannot be fully illustrated here; however, a summary is provided below.

Perceptions of the Course Content

The same set of questions regarding course content was asked in both years. These questions were aimed at discovering whether the student learning outcomes of the subject had been achieved. The 2007 scores were higher for all questions except the one regarding more complex interpretations than earlier subjects as shown on Table 1 in the appendix. Thus, it could be argued that the new delivery mode had a positive impact on achieving student learning outcomes and is indicative of deeper learning activities. Positive evaluations of the learning experience were found in other Australian case studies of online delivery, including Schofield and Richards (2001) and Carver and Cockburn (2006). Further, most overseas evaluations found positive outcomes from blended active learning formats (Barber 2007, Smith and Rupp 2004, Stewart Wingfield and Black 2005).

Changes to the lecture

The survey results indicated that, having tried elearning through edustream, students had a strong preference for traditional delivery mechanisms. This occurred across all groups. The satellite campuses held this preference significantly less than Wollongong students. This situation probably reflects satellite campus students having prior experience with this mode of delivery and thus being more familiar with its study requirements. Nevertheless, they still preferred traditional delivery if it was available. The in-class discussions supported these results with a strong preference expressed for traditional lectures particularly in Wollongong. Satellite campus students also indicated a preference for video lecture over edustream. This result is interesting, given many Wollongong students' particular habit of only spasmodically attending lecture classes, and is contrary to the literature on the topic as discussed above. It is also inconsistent with a large initial rush of students into the subject when they thought there were 'no lectures' involved.

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[1] Another problem associated with this option is that it can considerably increased the download time for power point slides, especially for students using 'dial up' internet connections at home.

[2] Students have complained about group work assessment in that it allows for 'free riding', where some students do not contribute fairly to the combined output. While there are mechanisms to overcome this, they require considerable instructor time to monitor the process.

Previous evaluations of online delivery have reported mixed responses regarding the benefits of flexibility. It appears to be more valued by non-traditional students, women with home duties, older workers and external students (Frederickson, et. al undated, Smith and Rupp 2004). Tasker, et al. (2003) found that responses varied by the learning style of students, whereby 'verbal' learners who preferred written or spoken explanations were more engaged than 'visual' learners who preferred visual representations of the materials. They also noted that most students were 'visual', although a higher proportion of verbal students were female and that younger students tended to be more visual than older ones. Thus, further investigation into to students' preferred learning styles is needed when designing appropriate delivery mechanisms.

Subject design

The response to the use of modules, activities, the review of content in the seminars and the structured task assessment were all good, as shown on Table 2 in the appendix in the appendix. The tutors reviewed all the major concepts in each week's lecture in the subsequent seminar period. This review was highly valued by students, particularly those taking the BBA or other degrees. However, it may have caused 'minimizing' students to not do the activities as they knew they would be covered in the seminar. While it would have been desirable to not directly review the concepts but rather to construct seminar activities incorporating this knowledge, a cautious approach was adopted as the lecturer lacked confidence that students would do the required learning independently. When students did not do activities prior to seminar class, it made it difficult to extend the ideas and concepts in class as would have been desirable in different circumstances. A common comment made in Australian evaluations of active learning formats is that they result in a heavier workload than students are used to (Schofield and Richards 2001, Carver and Cockburn 2006, Allen, et al. 2006).

Students were less impressed by the group work. To some extent this poor evaluation could have occurred because only minimal group work was included. However, they did not want more group based assessment, which indicates a general dislike for group work in their subjects. While other studies found that online students welcomed team work and found it academically, socially and psychologically beneficial (see for example Carver and Cockburn 2006), others such as Allen, et al. (2006) found complaints regarding the lack of participation by some group members or that students tended to cooperate, by dividing projects into distinct individual tasks, rather than collaborate. A similar situation was paralleled in this subject.

Continuous assessment in this subject comprised four seminar tasks based on major elements of the course content. These tasks were highly structured and scaffolded upon each other to build up student knowledge sequentially, allow them to apply concepts to real world problems and to allow them to investigate one issue from a number of perspectives if they chose to. The evaluation of the tasks indicates that they were well received and met their learning objectives. The last task, by which time students had worked out marking expectations, was particularly well done. The use of structured tasks to encourage active learning is strongly supported in other case studies (for example, Craig and Pattern 2006, Wretlind, et al. 2007, Carver and Cockburn 2006, Leiboff 2004, Meyers and Nulty 2002).

Reflection

Environmental Economics was run as an experimental blended elearning subject in 2007, which involved the replacement of the traditional face to face lecture and tutorial format with online lecture materials and a two hour interactive face to face small group seminar program. The purpose of this experiment was to increase student engagement with the subject content and improve learning outcomes. As the above evaluation indicates, many of these objectives were achieved although students strongly indicated a preference for the more traditional delivery mechanism. These contradictory findings can be explained by either a situation where, by third year, students had developed surface learning styles which allowed them to pass subjects efficiently by minimizing study effort, or they liked active learning processes but had a particular dislike of the edustream delivery option. These propositions are tested below.

If University of Wollongong economics students have typical 'Generation Y' learning preferences as developed in the literature, the following outcomes would be expected.

i. **Students need structured learning to become independent learners.** This finding was strongly supported in the evaluation, with students expressing support for the structured or scaffolded elements of this subject, particularly the tasks and the revision activities.
ii. **Students are highly sociable and prefer group learning.** The evaluation did not support this expectation. Students did not interact strongly with each other in or out of class and did not seem to like the group aspects of the subject nor want them expanded.
iii. **Students rely heavily on internet and electronic resources for research and course materials.** This finding was also strongly supported in the evaluation.
iv. **Students accept rules and supervision if clearly laid out.** This was the case in ECON309 with students attending seminars which were designated as compulsory without question and undertaking roles laid out in the subject design provided marks were attached to them. However, they were reluctant to participate in activities which did not directly earn marks.
v. **Students have diverse learning styles and need a range of activities integrated into the subject material.** This subject was redesigned to accommodate active or deep learning styles. A number of students did not like this. Non-english background overseas students were looking for more written resources. Others seemed to prefer traditional delivery which is more associated with verbal and logical-mathematical intelligence. Thus, it is necessary to accommodate a range of learning styles in subject design.
vi. **Students learn best through hands-on assignments, problem solving and case studies which develop independent, flexible thinking.** In the evaluation, students strongly supported the 'real world' elements of the course content and assessment tasks.
vii. **Students expect quick responses to queries and online access to materials.** ECON309 students were not demanding in expecting immediate responses to emails although these were always provided in one or two days. They preferred to email questions to the tutors rather than

attending designated office consultation periods which speeded up responses. They did have a strong preference to obtain subject materials online.

viii. **Students do not like lectures but prefer interactive small group classes.** ECON309 students indicated that they preferred lectures to edustream but they also liked the seminars, which were in effect small group classes.

ix. **Overseas students prefer online classes as it helps them overcome language problems.** This was not the case in ECON309, with foreign students doing relatively badly under this blended format.

Based on these findings, it can be concluded that these students had a range of different learning styles and that a blended approach introduced for the first time in the second session of their third year is not going to satisfy all students' learning needs. Overall, the evaluation does indicate that the students generally fit into the expected 'Generation Y' model in terms of their preferences for structured learning, online resources, and real world problem solving activities. These results support the use of active learning processes. However, they did not return the expected outcomes for delivery mechanisms, group work and student engagement. As discussed above, these results were similar to some other Australian case studies involving online learning.

It is clear that the delivery mechanism based on downloadable audio lectures did not meet student needs. Their stated preference for traditional face-to-face lectures however is questionable. It certainly appears that surface learning is common in this group but it is also possible that this may be a learned habit by third year where they find it the most efficient means of achieving pass results in their subjects in a situation where most are working relatively long hours in casual jobs during the semester[3]. It is tempting to classify economics students as probably having logical-mathematical intelligence who may prefer traditional lectures to access course content. However, their failure to attend lectures in traditional lectures indicates that this is not the case. It is important to note that the stated preference for lectures did not result from a comparison with other options, such as a mix of traditional lecture and online components, enhanced visual materials online, interactive online activities, etc. Adding such elements effectively involves considerable time and skills by the subject designer. It is thus important to know the learning styles and preferences of the student body before committing this investment.

The results in relation to group work (Table 2) and student engagement (Table 3 in the Appendix) also raise important issues in the Australian educational context. Group work assessment was not high in this subject design, which lowered the value that students placed on this activity. There is a body of techniques available to address group work problems but again these require additional instructor time, resources and skills to implement. Students did exhibit a high capacity to work co-operatively, if not collaboratively, when undertaking these tasks, although they preferred electronic communication to using the allocated group meeting times or group discussion spaces to organise tasks.

[3] Indicative data from the surveys suggested that these students were in paid work on average 27 hours a week.

This subject had a significant proportion of students who were from overseas, either on-campus as full-time ESL students or exchange students predominantly from the U.S.A. The main objective of the arbitrary group assignment in this subject was to encourage their interaction with Australian students. While overall engagement scores were not high as shown in Appendix 1, the score from overseas students to the question 'I had serious conversations with students of different race or ethnicity than my own while studying ECON309' indicates a strong improvement for these students, so some benefits in terms of improved engagement (NSSE 2006) did arise from this process.

Wollongong University students are involved in long hours of paid casual work and many live in southern Sydney. These factors severely reduce the time that they spend on campus. As a consequence, campus social relationships are limited and thus their forms of engagement with their studies, fellow students and teachers appear to be quite different to those in the U.S.A. as described in NSSE (2006) and related papers. This also suggests that further research is required into Australian student needs and requirements before mechanisms can be designed to enhance student engagement in particular contexts.

A further objective in the subject redesign had been to improve ESL students' learning. This is now recognised as an emerging problem in an institution which was one of the first and most successful at attracting full-fee paying overseas students, who now predominantly come from the Middle East and Asia. Separate ESL results were not reported for this project. However from instructor observation, they were less engaged than other students and less able to adapt to the new delivery mechanism. While overall grades improved in 2007, those for ESL students went down. U.S. student engagement surveys also reported lower levels of engagement for Asian students. These results are contrary to that expected for the literature, which indicated that international students may prefer to use technology instead of direct communication with peers and faculty to avoid embarrassment (Zhao, et al. undated).

Conclusion and Recommendations

In many ways, the results to this case study open up as many questions as they answer. The students do conform with the expected Generation Y model in terms of their responses to the active learning processes trialled here. This strongly supports the continuation of these innovations and their adoption in other economics subjects at this institution. Such activities: scaffolded tasks, modules with review activities, laboratory sessions, etc. can be incorporated into the subject design without online delivery. The main benefit arising from the online audio lecture was that it freed up the lecturer's time to devote to the smaller group teaching, which also provided effective.

Issues related to the most appropriate delivery mechanism, group work and improved student engagement need further research into student learning styles, needs, experiences and expectations. Student behaviour in other subjects taught in the traditional manner by this lecturer indicates a continued trend towards not attending lectures and relying on online power point slides, hopefully supplemented by textbooks and reading, to access course content and fulfil assessment tasks. Thus

some form of online delivery would seem appropriate, although audio lectures may not be the most suitable medium.

As a consequence of these conflicting results, it was decided to retain this format for 2008 with the following modifications:

- To accommodate variations in learning style, the audio lecture to be supplemented by written lecture notes, specifically to support ESL student learning, plus occasional video conference / optional lectures for vital components of the course[4].
- Additional visual material to be added to the online materials to increase interest and direct student attention to the topical nature of the subject[5].
- New technologies becoming available to visually record the development of diagrams and the more theoretical aspects of the content will be investigated and used as appropriate. This innovation will free up class time to provide extension of the content towards new, topical applications in order to stimulate more class debate[6].

Overall, and despite some negative reactions, it was generally considered that these innovations improved both the teaching satisfaction of the lecturer and the learning outcomes for the students, including an overall improvement in final grades. Initial reflections on the 2008 pilot are more positive than in 2007, indicating that students need time to adapt to new teaching approaches. Despite initial fears, student numbers in 2008 were similar to 2007 and both years were well above the average for third year elective economics subjects. Students retain their habit of relying on the seminar review to obtain course content, although they are placing considerable effort and enthusiasm into their assessment tasks. The group work component has been more successful, with groups being allowed to self-select this session. This year, groups have chosen to have combined presentations rather than individual ones as occurred last year, and bonds between most groups persisted throughout the semester.

The University of Wollongong is indicating a preference to place more learning online and to move to more collaborative learning approaches. This pilot indicates that to do this effectively, we need a much better understanding of economics students' preferred learning styles in order to design effective teaching modes. It also raises questions as to whether Wollongong (Australia?) students have different engagement practices with their studies to the North American model represented by NSSE and the Generation y learning literature. In particular, the time demands from the need to undertake paid work during semester appears to be severely impacting on their engagement with their subject materials and their studying practices, and this needs to be better understood in order to design effective online learning packages for students.

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[4] There appears to be greater acceptance of the alternative delivery style in 2008, either due to these additions or because students entered the subject in 2008 more aware of the new approach.

[5] Due to time constraints this innovation was not implemented in 2008. However, the release of the Garnaut Climate Change Review and the Australian Government's 'green paper' on a carbon emissions trading scheme gave the subject significant policy topicality and these elements were included in the content.

[6] Again, time constraints prevented the introduction of this innovation. Instead, periodic 'lectures' were given to cover the theoretical aspects of the subject, leaving tutors free to focus on the applications.

APPENDIX 1 - TABLES

TABLE 1: Perceptions on the Emphasis in Content of ECON309

		CITIZENSHIP		DEGREE			CAMPUS	
2006	All students	Australian	Overseas	B.Comm	BBA	Other	Wollongong	Satellite
Basic theory[7]	3.50	3.54	3.64	3.50	3.60	3.50	3.57	3.29
More complex[8]	3.36	3.08	3.64	3.00	3.20	4.00	3.38	3.29
Make judgements[9]	3.29	3.38	3.45	3.75	3.33	3.25	3.29	3.29
Application to practical situations[10]	4.04	4.00	4.18	3.75	4.00	4.50	4.05	4.00
UOW emphasis on academic work[11]	3.50	3.69	3.45	3.50	3.67	3.50	3.43	3.71
2007	All students	Australian	Overseas	B.Comm	BBA	Other	Wollongong	Satellite
Basic theory	3.85	3.86	3.82	4.05**	3.76**	3.82**	3.90	3.74
More complex	3.26	3.23	3.45	3.14	3.32	3.18	3.17	3.47
Make judgements	3.70	3.81**	3.18**	3.48**	3.96**	3.36**	3.50	4.17
Application to practical situations	4.28	4.26	4.64	4.14	4.32	4.45	4.21	4.44
UOW emphasis on academic work	3.69	3.84**	3.09**	3.81	3.68	3.18	3.52*	4.05*

** Significant difference at 0.05 or 95% confidence level.
* Significant difference at 0.10 or 90% confidence level.
SCALE: 1 'Very Little' to 5 'A Lot'.

[7] Question: In ECON309, the coursework emphasized basic elements of ideas or theory.
[8] Question: In eCON309, the coursework emphasized synthesizing and organizing information into more complex interpretations than earlier subjects in this degree.
[9] Question: In ECON309, the coursework emphasized making judgments about the value of information, arguments or methods.
[10] Question: In ECON309, the coursework emphasized applying theories or concepts to practical problems or in new situations.
[11] Question: the University of Wollongong emphazises spending time on academic work and studying.

TABLE 2: Evaluation of Teaching Delivery Innovations

Innovation	All students	Australian	Overseas	B.Comm.	B.B.A.	Other	Wollongong	Satellite
Modules[12]	3.38	3.50	3.00	3.24***	3.68***	2.73***	3.17**	3.84**
Activities[13]	3.56	3.57**	3.64**	3.57	3.71	3.09	3.45	3.82
Seminar Review[14]	3.83	3.79	4.27	3.57*	3.92*	4.00*	3.98	3.50
Tasks[15]	3.95	3.98**	3.82**	3.90**	4.00**	4.00**	3.95	3.95
Tasks deepened[16]	3.90	3.86	4.00	3.76**	3.92**	4.09**	3.95	3.78
Group Work[17]	2.37	2.21	2.45	2.14**	2.92**	1.55**	2.19	2.78
Know group students[18]	2.79	2.66	3.09	2.62	3.13	2.27	2.81	2.75
More group assessment[19]	2.49	2.31	2.64	2.00	2.71	2.82	2.60	2.24

[12] Question: I found the division of weekly lecture material into modules helped me understand the content of this subject.

[13] Question: I found the activities at the end of each module helped me understand the content of this subject.

[14] Question: I found the review of lecture content in the weekly seminars helped me understand the content of this subject.

[15] Question: I found the assessment tasks helped me understand the content of this subject

[16] Question: I found the assessment tasks extended and deepened my knowledge of the content of this subject.

[17] Question: I found the group work in this subject helped my understanding of the content of this subject.

[18] Question: I found the group work helped me to get to know my fellow students.

[19] Question: I would prefer to have a large component of group work based assessment.

TABLE 3: Levels of Self Perception and Skills Development

		CITIZENSHIP		DEGREE			CAMPUS	
ECON309 contributed to **2006**	All students	Australian	Overseas	B.Comm.	BBA	Other	Wollongong	Satellite
Codes of values and ethics[20]	2.96	3.00	2.91	2.25	2.87	4.00	3.00	2.86
Understanding people from other ethnicity[21]	2.61	2.31	2.73	2.50	2.53	2.50	2.81	2.00
Self-understanding[22]	2.39	2.98	2.73	1.75	2.40	3.00	2.57	1.86
Independent learning skills[23]	2.82	2.85	2.64	2.75	2.73	3.00	2.86	2.71
Cooperative learning skills[24]	2.46	1.92	3.18	2.25	2.67	2.25	2.71	1.71
Work related skills[25]	2.29	1.77	3.00	2.25	2.40	2.25	2.57	1.43
Use electronic medium in subject[26]	3.82	3.92	3.73	4.25	3.67	3.75	3.67	4.29
Mixed with people from other ethnicities[27]	2.36	2.08	2.55	2.25	2.53	1.25	2.48	2.00
UOW encourages contact among students of different ethnicities[28]	3.00	3.17	3.18	4.00	3.00	3.30	3.38	2.67

[20] Question: My experiences in ECON309 contributed to the further development of my personal code of values and ethics.

[21] Question: My experiences in ECON309 contributed to my understanding of people from other racial and ethnic backgrounds.

[22] Question: My experiences in ECON309 contributed to my understanding of myself.
[23] Question: My experiences in ECON309 contributed to my learning to work on my own.
[24] Question: My experiences in ECON309 contributed to my learning to work effectively with others.
[25] Question: My experiences in ECON309 contributed to me acquiring work-related skills.
[26] Question: The frequency with which I used electronic medium for the coursework for ECON309 was:
[27] Question: I had serious conversations with students of different race or ethnicity than my own while studying ECON309:
[28] Question: The University of Wollongong encourages contact between students from different racial or ethnic backgrounds

TABLE 3 cont…

ECON309 contributed to **2007**	All students	Australian	Overseas	B.Comm.	BBA	Other	Wollongong	Satellite
Codes of values and ethics	3.02	2.93	3.18	2.86	3.16	2.82	2.98	3.11
Understanding people from other ethnicity	2.42	2.36	2.45	1.278	2.75	1.55	2.55	2.12
Self-understanding	2.42	2.19	2.73	2.19	2.54	2.45	2.48	2.29
Independent learning skills	3.25	3.26	3.09	3.33**	3.16**	3.18**	3.43	2.83
Cooperative learning skills	2.63	2.60	2.45	2.81**	2.72**	1.82**	2.60	2.72
Work related skills	2.23	2.18	2.27	1.95*	2.26*	2.36*	2.20	2.31
Use electronic medium in subject	4.12	4.05	4.18	4.29	3.88	4.27	4.05	4.28
Mixed with people from other ethnicities	2.29	2.22	3.28	2.29	2.26	2.18	2.62**	1.44**
UOW encourages contact among students of different ethnicities	3.21	2.45	3.00	2.95	3.35	3.18	3.19	3.29

SCALE: All questions except the one on electronic medium 1 ‘Very little’ to 5 ‘A lot’.
Electronic medium question 1 ‘Low’ to 5 ‘High’.

References

Allen, B., Crosky, A., McAlpine, I., Hoffman, M. and Munroe, P. (2006), 'A blended approach to collaborative learning: Can it make large group teaching more student-centred?' Proceedings of the 23rd annual ASCILITE Conference, 'Who's learning? Whose technology?, University of Sydney, pp. 33 – 42.

Aviles, K., Phillips, B., Rosenblatt, T. and Vargas, J. (2005), 'If Higher Education Listened to Me', EDUCAUSE Review, September/October, pp. 17 – 28.

Barber, M. (2007), "Reassessing Pedagogy in a Fast Forward Age", *International Journal of Learning*, Vol. 13, No. 9. pp. 143 – 149.

Carini, R.M., Kuh, G.D. and Klein, S.P. (2006), "Student Engagement and Student Learning: Testing the Linkages", *Research in Higher Education*, Vol. 47, No. 1, February, pp. 1 – 32.

Carver, T. and Cockburn, T. (2006), "Making law more accessible: Designing collaborative learning environments for physically remote Generation Y students", in Proceedings of OLT 2006 Conference, Learning on the Move, Brisbane, Australia. Accessed from http://eprints.qut.edu.au.

Craig, D.V. and Patten, K. (2006), "Action Research in the Online Environment", *The International Journal of Learning*, Vol. 13, No. 7, pp. 157 – 168.

Fredericksen, E., Pickett, A., Shea, P., Pelz, W. and Swan, K. (undated), Student Satisfaction and Perceived Learning with On-line Courses: Principles and Examples from the SUNY Learning Network, SUNY Learning Network, The State University of New York.

Goldgehn, L.A. (2004), 'Generation Who, What, Y? What You Need to Know About Generation Y', *International Journal of Educational Advancement*, Vol. 5, No. 1, pp 24 – 34.

Hughes, C., di Corpo, S., and Hewson, L. (2006), 'Online facilitation: Strategies for gaining engagement in different OLEs', Proceedings of the 23rd annual ASCILITE Conference, 'Who's learning? Whose technology?, University of Sydney, pp. 367 – 377.

Krause, K.L. (2005), "The changing student experience: Who's driving it and where is it going?", paper presented to Student Experience Conference: Good Practice in Practice, Charles Sturt University, Wagga Wagga, N.S.W., 5-7 September.

Leiboff, M. (2004), "Working to engage: Structuring and designing the online activity", paper presented to QUT Online Teaching and Learning Conference 2004: Exploring Integrated Learning Environments, pp. 105 – 112.

Lisi, J. (2006), "Sustaining Quality and Integrity of Education within Online Environments", *The International Journal of Learning*, Vol. 13, No. 4, pp.129 – 134.

McClelland, B. (2006), "Action-Learning for Postgraduate Business Enterprise Education", *The International Journal of Learning*, Vol. 13, No. 4, pp. 55 – 63.

Meyers, N.M. and Nulty, D. (2002), "Assessment and student engagement: some principles", paper presented to the Learning Communities and Assessment Cultures Conference, University of Northumbria, 28-30 August.

NSSE National Survey of Student Engagement Annual Report (2006), Engaged Learning: Fostering Success for All Students, NSSE National Advisory Board, USA.

Oblinger, D.G. (2005), ' Learners, Learning, & Technology: The Educause Learning Initiative', EDUCAUSE Review, September/October, pp. 67 – 75.

Schofield, N.J. and Richards, C. (2001), "Attitudinal and Cognitive Changes in On-line Learning", in B. Cope and M. Kalantzis (Eds), Proceedings of the Learning Conference 2001: Learning for the Future, pp.3-13.

Smith, J. and Brown, A. (2005), 'Building a culture of learning design: Reconsidering the place of online learning in the tertiary curriculum', Proceedings of the ASCILITE conference, Balance, Fidelity, Mobility: maintaining the momentum?, pp. 615 – 623.

Smith, A.D. and Rupp, W.T. (2004), 'Managerial implications of computer-based online/face to face business education: a case study', Online Information Review, Vol. 28, No. 2, pp. 100-109.

Steiner, O.L. and Segal, Z. (2004), "E-Learning in High Education", The International Journal of Learning, Vol. 11, Proceedings of the Learning Conference 2004: Learning Today: Communication, Technology, Environment, Society, pp. 45 – 53.

Stewart Wingfield, S. and Black, G.S. (2005), 'Active Versus Passive Course Designs: The Impact on Student Outcomes', *Journal of Education for Business*, Vol. 81, No. 2, pp. 119 – 125.

Tasker, R., Miller, J., Kemmett, C. and Bedgood, D.R. (2003), 'Analysis of student engagement with online chemistry modules using tracking data', Proceedings of the 20th Annual Conference of the Australasian Society for Computers in Learning in Tertiary Educations (ASCILITE), Adelaide, 7-10 December.

Weiler, A. (2004), 'Information-Seeking Behavior in Generation Y Students: Motivation, Critical Thinking, and Learning Theory', *Journal of Academic Librarianship*, Vol. 31, No. 1. pp. 46 – 53.

Wretlind, K., Rundberg, M. and Warfvinge, G. (2007), "Problem Based Learning on the Net", *International Journal of Learning*, Vol. 13, No. 9. pp. 57 - 63.

Zhao, C.M., Kuh, G.D., and Carini, R.M. (undated), "A Comparison of International Student and American Student Engagement in Effective Educational Practices", National Survey of Student Engagement, Indiana University, Bloomington, USA.