

Using the web to enhance tertiary education learning experiences

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Abstract

The continuing need to enhance the quality of education in all tertiary sectors is ever present. The development and delivery of large undergraduate courses, presents many challenges to those involved in both design and delivery, to ensure that the desired learning outcomes are achieved in the most effective way possible. When these students represent, as they do at Central Queensland University (CQU), a combination of internal and distance students, domestic and international students, the challenge to achieve these outcomes becomes even more complex. As educators in the tertiary environment we are mindful of the need to be innovative in our utilisation of web-based resources, to evaluate the benefits or otherwise to our students as learners and enhance the quality of their learning experience. Importantly we need to remember that we are learners too and our adoption of web-based technology is an integral part of the continuous evolution and development of all educators.

This paper reports on the initial findings of a recent survey to measure students' general expectations and perceptions of web based flexible delivery in three core undergraduate subjects in accounting, management and law. In particular, the web-based initiatives being investigated in this study relate to online material delivery, online assessment and online interaction and engagement.

Note: To maintain consistency, throughout this paper, the term 'course' is used to refer to an individual unit of study undertaken as part of an undergraduate program. Some institutions may refer to these as 'subjects' or 'units'.

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Introduction

Many challenges face educators in the tertiary sector today. This paper contributes to a growing body of knowledge in teaching and learning and, in particular, the use of web based technology, as a tool which can be effectively employed to enhance students' learning experiences. There is a need to provide an effective learning environment which embraces the educators' willingness to trial new technological innovations in the provision of flexible learning delivery. Whilst it is vital to tap into the available innovations, this does not require the immediate adoption of every new resource. As educators involved in flexible delivery, we are mindful that we need to innovate; evaluate by investigation and reappraise, and thereafter improve what we do.

Literature Review

Literature in the field of distributed learning via the internet, web-enabled courses versus face-to-face delivery and other topics relating to the use of web-based technology is growing at a rapid rate. The amount of research addressing web-based delivery as a supplement or replacement to face-to-face delivery is also growing. A number of researchers have reported that whilst the delivery of online courses enhances student learning in some respects, they also caution against using the technology without adequate regard for the learning outcomes being sought (Buckley, 2003; Lawther & Walker, 2001; Willett, 2002). There remains a number of researchers who warn that the

teaching should drive the technology and not vice versa (Petrides, 2002).

According to MacGregor (2001), studies of students' attitudes towards early forms of distance education indicated that students typically preferred the traditional classroom. She also pointed out that research by Savard, Mitchell, Abrami and Corso (1995) on computer mediated communication in distance learning showed there were rarely any significant differences between the attitude towards learning and achievement of students in distance and traditional settings. Mariani (2001) noted that new technologies including discussion boards (or lists), should only supplement traditional teaching.

Smith and Ferguson (2002) argue that that much can be gained from online delivery; the encouragement of deeper levels of discussion, the ability to consider responses due to the asynchronous nature of the medium, and the minimisation (if not elimination) of the power differential between student and teacher. However Smith and Ferguson (2002) also warn that with these benefits come a number of disadvantages including the potential technology failures, the lack of face-to-face and therefore interpersonal cues, and from the instructor's viewpoint, a great deal of time and effort in converting traditional text-based content to information suitable for online delivery. Overall, it is suggested that even though delivery online offers new challenges, it is viewed as worthwhile by those on both sides - the learners and the facilitators (Smith & Ferguson, 2002).

With an increasing emphasis being placed by universities on using technology to enhance students' learning, many universities are using web-based approaches to teaching and learning. It has been suggested that online learning potentially provides meaningful learning activities (Anderson, 1996). But, as O'Malley (1999) notes, new educational technologies, such as web-based learning, are often implemented without any assessment of impact on students. In many universities in Europe and North America, the use of face-to-face lectures combined with tutorials or workshops is regarded as the preferred, if not the only, delivery medium for materials. That has not been, and is not, the case in Australia. Some Australian universities have been designated as centres for distance education, and in particular, CQU has established a reputation as a provider of quality distance education. Using web-based technologies is of great interest to these institutions including CQU, as it not only has the potential to improve the delivery and enhance students' learning in distance education, but is increasingly being used to supplement face-to-face delivery.

According to Slay (1997) problems have emerged in the development of web-based delivery packages and tools because academics have little, if any, experience in designing and using this medium of material delivery. These developmental problems can be exacerbated because, as George (1996) argues, the form of delivery can produce particular types of learning behaviours so that web-based delivery is not a neutral medium. As it is not neutral, we, as academics, need to study the impact of the medium and the material on students and this research is intended to examine students' perceptions of web based learning materials in a number of different contexts and disciplines. O'Malley (1999) argues that prior educational conditions, perceived characteristics of online learning and characteristics of the student, influence the perceived effectiveness of online learning.

As educators using technologies in our teaching, it is important to consider the relationships between the technology and teaching strategy so that we can better design the courses. We often believe that we know which technique is the best for our students, no matter what age or learning style. Our view however needs to remain open, capable of review and willing to accept the many challenges that tertiary educators face. The task, in particular, is to produce well-rounded and self-directed individuals capable of contributing in an effective and valid way to their chosen profession.

The Study

With its headquarters in Rockhampton, Queensland, CQU has been through a metamorphosis similar to that of many tertiary institutions in Australia. CQU was established as the Queensland Institute of Technology (Capricornia) in 1967 and then became the Capricornia Institute of Advanced Education (CIAE) in 1971. Since then, CQU has survived a series of transitions: 1990, the University College of Advanced Education, 1992, the University of Central Queensland, and then finally, in 1994, became the Central Queensland University. Today the university has 22,660 students who study either via distance education or on campuses located in Rockhampton, Mackay, Bundaberg, Emerald, Gladstone, Singapore, Hong Kong, Malaysia, Fiji, Sydney, Melbourne, Brisbane, the Gold Coast and

China.

Distance education has been important to CQU for more than 30 years given its origins as a regional tertiary institution servicing a regional, rural community, and this has been identified as one of the key reasons for transition to more flexible and online delivery methods, that replaced the more commonly used print-based materials. This however, has started a move towards online and flexible delivery approaches even for those students studying on-campus. Given this change towards these new approaches to teaching and learning, it was considered appropriate to undertake research relating to student perceptions and expectations of online and flexible delivery methods, and contrast these to the more traditional forms of delivery.

The courses researched are all introductory-level, core, undergraduate courses in the Faculty of Business and Law at CQU. This study intentionally chose courses from the three different disciplines of management, law and accounting, utilising three different forms of alternative delivery and/or assessment in order to analyse the students' engagement and reactions. It was believed that these courses provide a unique opportunity to review the online education experience by considering the three differing but complementary forms of online education shown in Figure 1.

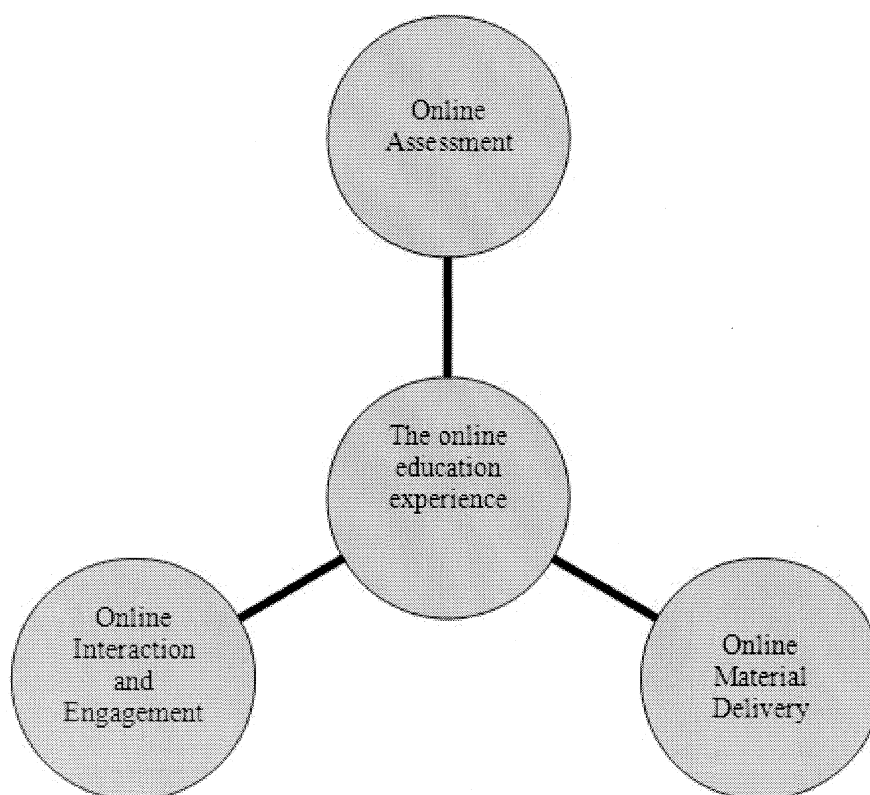


Figure 1. Components of the online education experience

Specifically, the management course utilises online assessment via multiple choice quizzes and discussion lists; the law course utilises a flexible form of material delivery via online lecturers, and the accounting course utilises online tests and discussion lists for assessment purposes. However, the courses differ not only in terms of the methods being utilised, but also in the content and nature of the courses themselves allowing the research to identify whether this variable is significant in terms of flexible learning and teaching. The management course covers mostly information at a conceptual level, the law course focuses more on understanding and the recognition, application and analysis of the law, and the accounting course is focused more upon issues involving analytical and numeracy skills.

Research Aims & Objectives

The objectives of the broader research conducted were to obtain:

- A measure of the perceptions of different groups of learners in relation to flexible delivery (i.e. gender, age/maturity, learning backgrounds, cultural backgrounds)
- An understanding of what a sample of students see as effective flexible delivery methods
- A measure of the extent to which learners view courses as either linked with generic skills or compartmentalised (view of teaching as skills building not just transfer of knowledge)
- An analysis of cross-referenced students studying different disciplines, with differing foci, to determine the extent to which this and other background factors influences student perceptions.

This paper reports only the findings in relation to students' general expectations in regard to flexible delivery; and, in particular, considers the responding cohorts' perceptions in respect of each of the different forms of on-line material delivery; assessment, engagement and interaction approaches. Further analysis is currently being conducted in line with these broader research objectives.

Methodology

This study utilised a self-administered questionnaire that was distributed during classes in each of the courses. It was provided to external students via mail and was also made available online. Completion of the questionnaire was entirely voluntary.

Sample

The population frame consisted of all students enrolled in at least one of three undergraduate level courses in the Faculty of Business and Law at Central Queensland University. Each of the three courses is a core unit in all Bachelor of Business programs. A total of 891 students responded to the survey, across a range of locations, representing a response rate of approximately 45%. For purposes of comparison and analysis, respondents were grouped into four categories in terms of their enrolment which is shown in Figure 3. The four categories were as follows:

- Distance education (those students enrolled via external/distance mode)
- Rockhampton (those students enrolled on the campus located in Rockhampton, Queensland. This was the original campus and has larger enrolment numbers than the other campuses located in regional Queensland, all catering predominantly to domestic students)
- Regional (those students enrolled on a regional campus in Queensland, located at Mackay, Gladstone, Emerald or Bundaberg)
- Australian International Campuses (those students enrolled on a campus catering only for International students, and located in cities throughout Australia.).

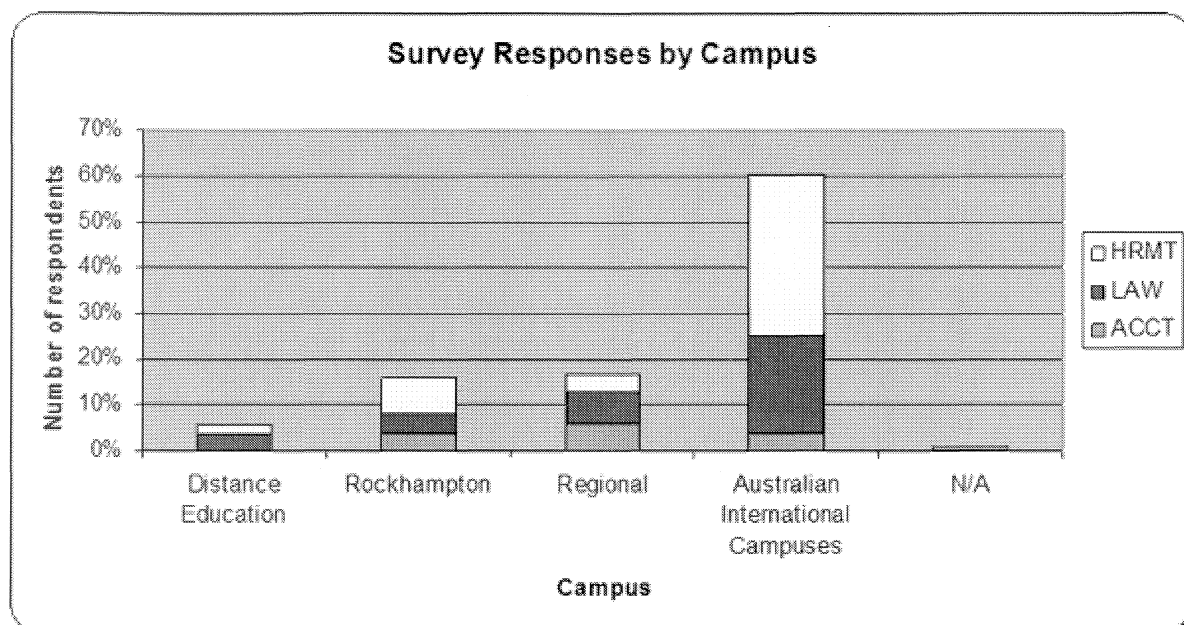


Figure 2. Survey Responses by Campus

General Information Findings

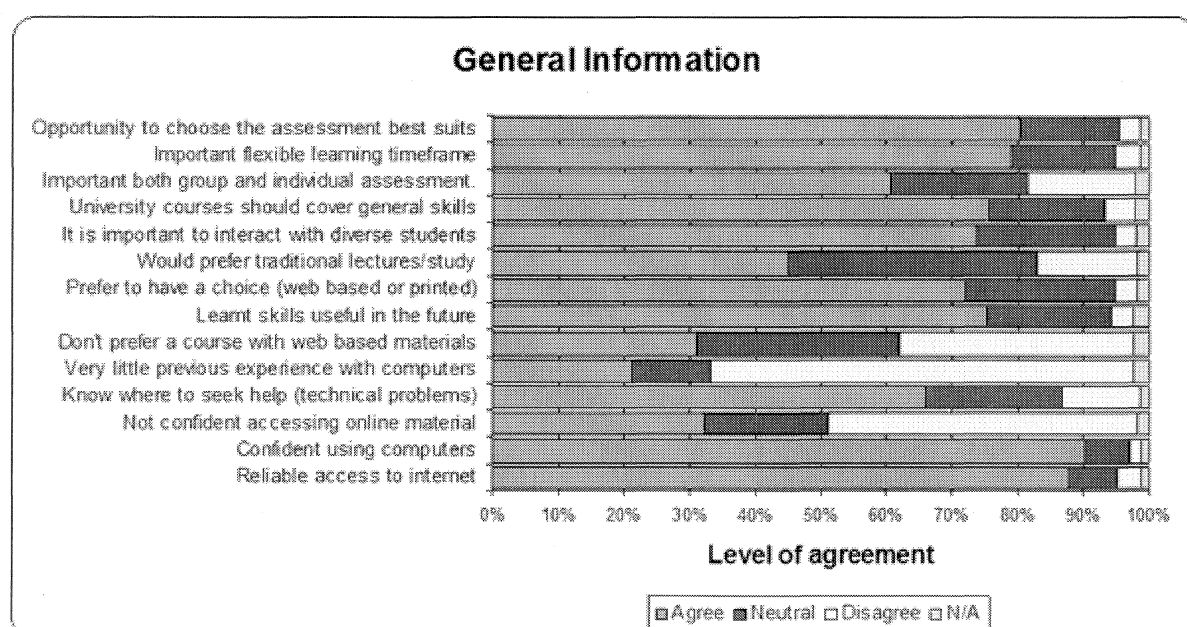


Figure 3. General Information

A series of generic statements were included in the survey in order to elicit student opinions and expectations in relation to flexible delivery. The students were provided with statements and given the opportunity to indicate a response ranging from strongly agree to strongly disagree. The questions related to general expectations and perceptions, and some statements were included in the negative to assist in identifying whether students considered the questions or answered arbitrarily. The results of these responses are shown in Figure 3.

By far the majority of students wanted the opportunity to choose an assessment piece best suited to them and welcomed a flexible learning timeframe. This may be related to the growing number of students with heavy commitments outside of study, who require the capability to manage their time across work, family and study commitments. Data was collected on these external issues within the survey, and although it is outside the scope of this particular paper, will be analysed to identify reasons for student preferences for flexible approaches to delivery and assessment.

It was also important to most student respondents that their course should cover general skills and the chance to interact with diverse groups of students. Most students, it was pleasing to note, recognised the value of learning skills which would be useful in the future. A majority of students had reliable access to the internet and were confident in their use of computers; however this level of assurance dropped in their awareness of where to seek help in the event of a technical problem and fell even further in terms of their confidence in accessing online material. The implication of this for educators highlights the importance of providing timely and user friendly support, particularly in the early stages of a course.

It was interesting to note that less than half of the respondents would prefer a traditional lecture and mode of study; a reasonable proportion (38%) were neutral on this question. Only a small group indicated that they would not prefer traditional methods of delivery. Old habits die hard and it is reasonable to predict that some students who had only experienced traditional delivery methods would expect a more traditional delivery of courses, in the same way that the majority also expressed a preference for having a choice in either web based or printed material.

Flexible Approaches to Delivery

Responses were obtained from 891 students. Some may have been enrolled in more than one of the courses studied, and therefore answered specific questions relating to more than one of the courses. In total therefore, 542 indicated being enrolled in the human resource course, 421 in the accounting course, and 583 in the law course. The following analyses are based upon these sample sizes.

Online Content Delivery

The law course in this study introduces the students to our legal system and specialises in the area of contract law. The ultimate aim is to foster an appreciation of the relevance of the law in our everyday lives to enable the students to recognise when a legal issue has arisen and be capable of finding and applying the relevant law. This is law for non-lawyers and as such, the constant challenge is to make the law less daunting and more accessible.

Microsoft Producer was used, this enables instructors to combine audio or video with Microsoft PowerPoint slides and produce a lecture on-line. The primary purpose was to enhance the learning experience of the students; and thereafter, to assess their feedback and the effectiveness of the on-line lectures as a teaching resource.

At its simplest, Microsoft Producer facilitates the provision of a voice-over to accompany each individual PowerPoint slide. For the ambitious there exists an array of additional options and the accompanying user notes are reasonably straightforward. Students may listen (or, indeed choose not to listen) to the whole lecture, to individual slides, or repeat slides if necessary for clarification. It is very similar to an audio tape player with play, pause and stop buttons.

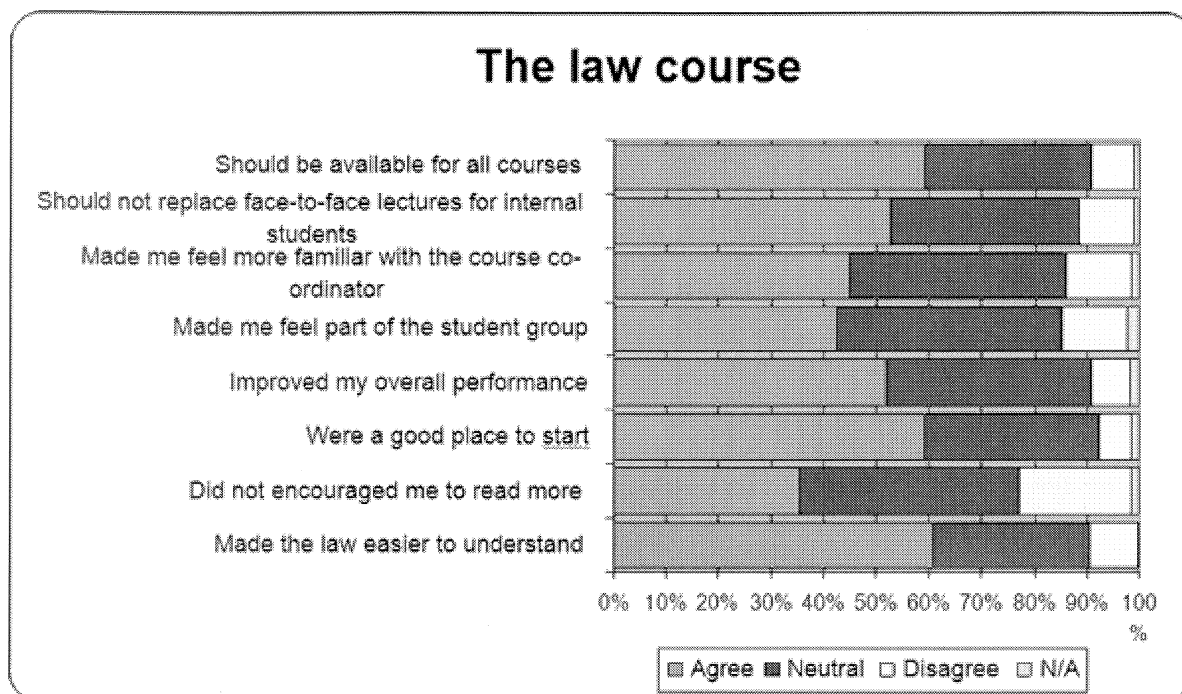


Figure 4. Results from the law course

The survey included a broad list of questions with regard to the on-line lectures in order to ascertain how this resource was perceived by the students. The majority of respondents would have the benefit of a face-to-face lecture and therefore the on-line lecture was an optional resource. The prime focus was to generate an interest in the law and to encourage the students towards self directed learning. It was good therefore to see that the majority of student respondents felt that the lectures made the law easier to understand and were a good place to start. More than half responded that their overall performance was improved indicating the on-line lectures provided them with the confidence to tackle law. A similar proportion felt that the resource made them feel part of the student group and more familiar with the course co-ordinator, being 43% and 45% respectively. As might be expected just over half of the respondents believed the on-line lectures should not replace face-to-face teaching; and more than half felt the resource should be available for all courses. The general findings in respect of this resource are therefore positive. It is necessary to consider the time involved in the preparation of the lectures, the advantage here is that they can be re-used and amended in parts if necessary. They appear to be most beneficial to external students who do not have face-to-face lectures.

Online Assessment

The management course considered in this study focuses on concepts relating to individuals, groups and organisations, and their interrelationships. In particular it utilises online facilities to facilitate assessment and encourage interaction and engagement online. All students were required to undertake four pieces of assessment. The first two pieces of assessment involved online multiple choice tests, the first assessing course content, and the second assessing library research skills; a generic skill identified as being required by these students throughout their entire program of study. The third piece of assessment involved students demonstrating application of theories and models learnt via a presentation; in-tutorial for internal students, and utilising the online Discussion Board for external students. The final piece of assessment was optional and provided students with the opportunity to further apply learnings. Internal students prepared summaries of in-tutorial activities, and external students chose to respond to three discussion list postings of fellow students from the third piece of assessment.

Figure 5 shows the results for this course, indicating students' responses to the use of the assessment methods described.

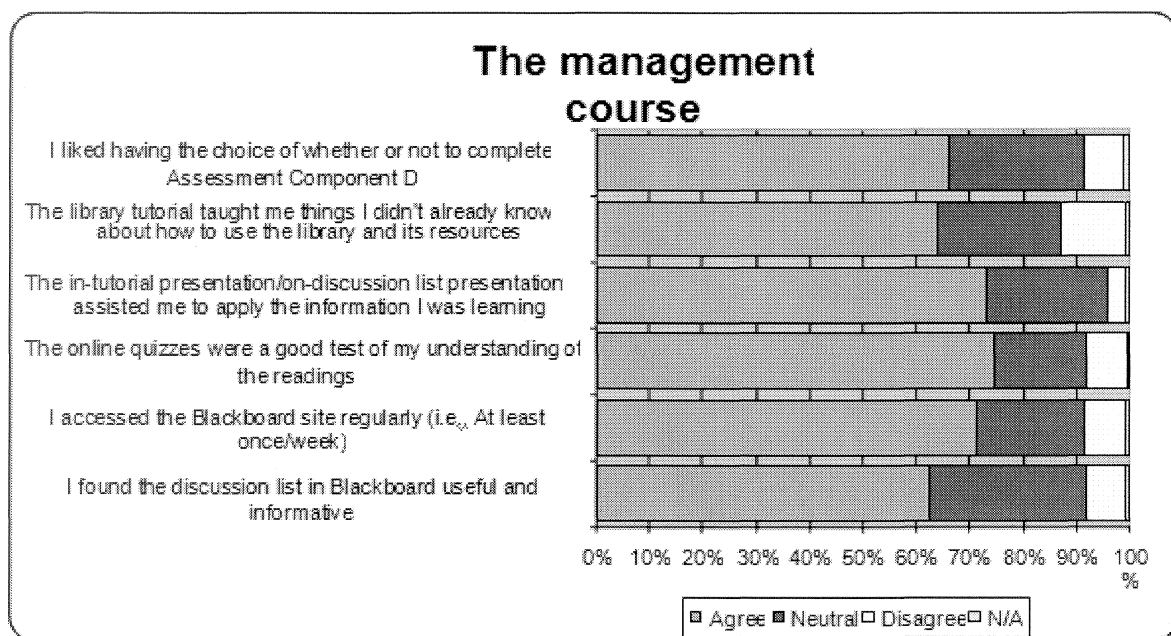


Figure 5. Results from human resource course

These results are extremely encouraging, highlighting a general acceptance of the assessment methods being utilised. In particular, over 70% of the students felt that the online quizzes were a good measure of understanding of concepts, and the presentation (whether online or in class) gave them the opportunity to apply their learnings. It is also positive that over 70% of the students reported regular accessing of the online site. Having online tests for all students would have contributed to this result, however to undertake this assessment only would not require this level of regular access, indicating that students visited the site for more than just assessment purposes. Finally, in line with the general findings that students prefer flexible delivery and the option of choosing assessment, this course provided the students with one piece of optional assessment which was favoured by over 65% of respondents.

Online Engagement and Interaction

The accounting course is designed for students to take a user perspective of accounting information, covering topics such as making investment decisions by analysing each of the financial statements, budgeting, costings and the capital financing of business. Internal and external students utilised an online system and completed 2 online tests worth 10% each. Other assessment included 10% for participation (discussed below), a small assignment worth 10% and then a 60% examination, covering aspects of the whole course. The participation mark for internal students was based on attendance and weekly class involvement whereas external students had to contribute throughout the term to the on-line discussion list. External students were given the option of off-line assessment in the form of assignments if their personal situation did not allow them access to online facilities (most difficulties were related to remote locations). The accounting students were used as a pilot study and were surveyed in the first term. The Law and Management courses were both surveyed in the second term.

From Figure 6, it is noted that 65% of all students believed that the online tests improved their learning with only 9% disagreeing. In regard to the interaction, internal and external students were asked different questions. Internal students were asked whether they would attend class if no marks were awarded and the results here are disturbing for those who favour traditional class teaching. 36% of students stated that they would have come anyway and 33% said they would not have come if marks were not awarded for participation. 37% of students were also reluctant to contribute to the in-class discussions.

The external students were asked questions relating to their contribution to the discussion list. In relation to the engagement and interaction of the students in the on-line discussion lists, it was pleasing to note that 50% of students believed that their contribution to the discussion list improved their learning. On the other hand, 50% were reluctant to contribute and would not have contributed

if marks were not awarded.

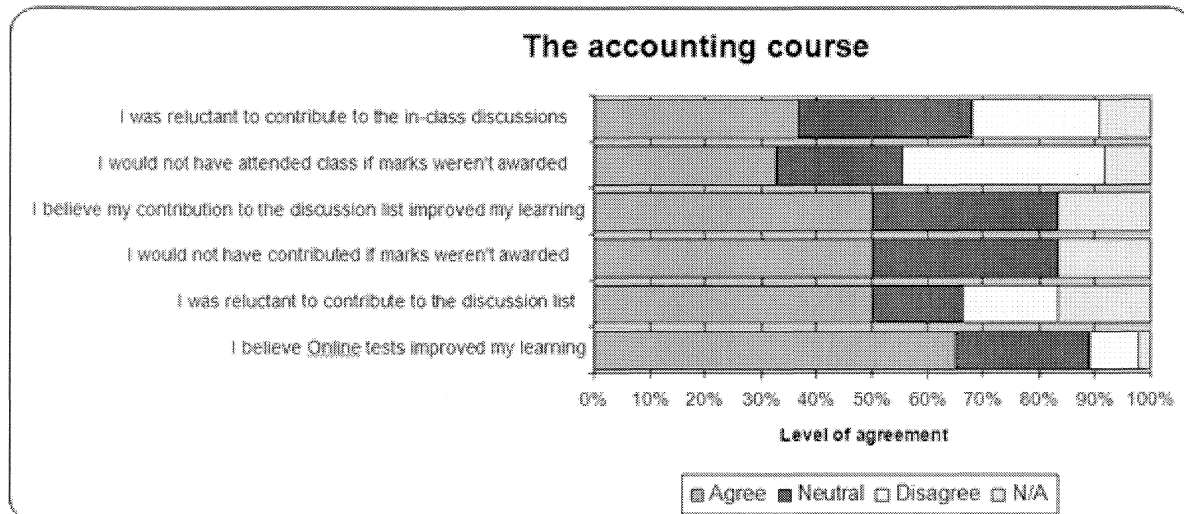


Figure 6. Results from the accounting course

Conclusion

There are a number of important findings from this research that will assist in the further development of flexible learning and teaching approaches utilising web based technology. In particular, it was clear from this study that web-based delivery:

- assisted to engage students with the material in a way that best suited them
- required adequate thought to technical support issues;
- benefited distance and non-English speaking students;
- facilitated the testing of knowledge and understanding; and
- improved the overall learning experience of students.

By looking at the context in which our students are studying, it is clear that many are supportive of flexible delivery approaches for purely practical reasons. There are a growing number of students with external work commitments, and the non-traditional approaches outlined in this research provide students in these situations with the ability to meet both work, home and study commitments. Clearly, the students are also focusing on the educational benefits of study and the contribution it can make to encouraging lifelong learning, rather than simply obtaining a qualification.

In adopting these flexible delivery and assessment approaches using information technology, however, the findings also provide a reminder that whilst our students are confident with their basic computer skills, they do require assistance and support with the specific technologies being utilised in the learning environment. The findings of this survey reinforce the importance of providing students with a clear indication of the support mechanisms available to them, to ensure when they encounter issues they have an understanding of where to turn for assistance, particularly in the early stages of adoption of such technology.

There is also a warning in these results that some students still prefer traditional forms of teaching and learning, and at the very least, would prefer a choice in how they engage with the learning activities. This reinforces previous claims (Kehoe et al., 2004) that these flexible approaches should not be seen as the answer in every situation, and should not be seen as a replacement for, rather than a supplement to, more traditional forms of learning, at least in the short term.

Specifically, the reaction to online content delivery reinforced the benefits of the use of this technology as a way of assisting students, particularly those studying externally, or those with English as a second language. The online lectures were seen as providing students with an ability to engage with the material, and to have information that is complex, explained to them as an introduction. In these results however, there was also a reminder of the needs of those students

preferring more traditional approaches, with a call for online delivery to supplement rather than replace more traditional approaches.

In relation to online assessment, the students reported tools such as quizzes providing them with the ability to test their knowledge and understanding of key concepts, whilst online (and in-classroom) presentations supplemented this by providing them the opportunity for application. Even in this situation where students were required to access online facilities only for assessment purposes, it was clear that they were keen to visit the site to engage further in the course and with other students.

The results from the third course investigated reinforced the finding in relation to online tests and discussion list presentation, with students reporting that the online tests improved their learning, and the external student cohort reporting that their contribution to the discussion list also improved their learning. It has also been interesting to note that, over the time discussion lists have been implemented as part of the assessment in the first year course, the discussions amongst the students have not been superficial, but have delved deeply into many of the course topics. The Faculty has a large cohort of part time external students who appear to be bringing their work experiences to the course which is beneficial to the whole cohort of students, especially those who have not had any work experience.

These results are however only a small component of the data collected in relation to the students, and therefore, future research will provide the opportunity for further analysis, particularly considering further the influence of factors internal and external to the student, on their expectations and perceptions in relation to web-based delivery and assessment approaches.

The findings from this research provide reinforcement for a great deal of our flexible teaching approaches. Whilst, if we reflect on the adoption of such techniques, we may concede that they have been implemented for other than purely pedagogical reasons, in assessing the reactions of our students, it is clear these approaches offer a range of benefits. In addition, the findings also reinforce the need to ensure that we continue to cater for the range of students within our cohort, and for their differing circumstances. Keeping in touch with the changing needs of our students, and obtaining timely and meaningful feedback on their perceptions and expectations of our learning and teaching approaches will ensure that we are able to meet their needs in the longer term.

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