Learning transformations through online education

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Introduction

Many educational and training organisations in Australia and overseas see 'flexible delivery' as a panacea for the problems facing education. 'Flexible delivery' is a term which describes teaching-learning approaches that address the shortcomings of face-to-face education in dealing with the factors associated with the provision of 'lifelong learning' and 'access and equity' in higher education. To date, the emphasis has been on the *delivery* of education, that is, identifying systems that can provide students with *what* they want, *when* they want it and *where* they want it. However, the use of these systems has not been accompanied by a commensurate understanding of teaching and learning in contexts where technology is being used. This dearth of knowledge has precipitated much debate about the place of flexible delivery as a alternative to more traditional approaches to teaching and learning, with opponents arguing that there is no substitute for 'placed-based' education that places learners in direct contact with the 'craft working practices' of individual academics (Mason & Kaye 1990).

This paper, based on a commissioned research study, is restricted to an analysis of flexible delivery defined by teaching and learning that is undertaken *totally online*. The main purposes of the study were to assess the applicability of online education for higher education and to document the issues that lecturers face in this environment. The data-collection techniques involved both quantitative and qualitative approaches; the paper concentrates on the quantitative to investigate how teaching and learning may have been transformed through the adoption of online education. The full report (Postle & Sturman in press) describes more fully the findings from both the qualitative and quantitative approaches to the study.

The emergence of online education at the University of Southern Queensland (USQ)

During the initial phase of USQ's history, it was involved solely in face-to-face teaching and learning. In this *Place-Based Education Model*, the typical roles of those involved in teaching-learning were essentially framed in a 'person culture' (Paulsen 1995); academics were left much to their own devices in preparing and presenting teaching materials. As long as timetables provided rooms and times for teaching and learning pursuits, academics were not required to work closely with other people. However, an administrative rationale was instrumental in establishing rules and systems for length of courses, numbers of lectures/tutorials, and assessment. Time was very much a controlling variable.

During the 1970s, USQ recorded a significant increase in 'non-traditional' students and, at the same time, developments in technologies provided the foundation to offer innovative teaching-learning opportunities. USQ responded to this by adopting distance education as a major education platform. This second phase of development in teaching and learning at USQ has been labelled the *Mixed Mode Model* where the typical roles of those involved in teaching-learning were changed, but only minimally. The 'person culture' remained dominant although the production of distance education materials (study materials, books of readings, audiotapes, videotapes) required that academics work with instructional designers. Others, such as graphic artists and audio-video specialists, were consulted only after the design was formulated. There remained a heavy emphasis on administrative policies and procedures designed for on-campus students.

The next chapter in the history of USQ's development of teaching and learning began with the dismantling of the binary system of universities and colleges and the development of the Unified National System of higher education. Equity was a central pillar of this new national system and universities were obligated to respond to this. Nowhere has this been more evident than in the core business of the sector—the provision of teaching and learning opportunities. At USQ, this is epitomised in the following statement taken from the Vice Chancellor's Home Page (USQ 2002):

> The University believes that flexible delivery is about giving people WHAT they want, WHERE they want it, WHEN they want it, IN their style, IN their place, IN their time. We are REGIONAL, FLEXIBLE and INTERNATIONAL.
> <http://www.usq.edu.au/vc/UniView/view.htm>

This resulted in a third phase of teaching and learning at USQ, labelled *Flexible Delivery Model*, of which 'totally online' is one feature. The roles of those involved in teaching-learning have placed participants in an uncertain world; it is the nature of this world that is the concern of this paper.

Research design

The method employed in the research was case study. One university's approach to online education and, in particular the approach taken in one Faculty, was the focus of the case study. Eight courses delivered totally online were selected for analysis. The rationale for their selection, other than being totally online, was that they had different purposes (graduate seminars, projects, and the like) and reflected a range of different content structures—from theoretically based to skills-based courses.

A range of data-gathering techniques was used: document analysis, quantitative analysis of course statistics, questionnaires sent to staff and students, and interviews with senior administrators. As indicated earlier, this paper reports on the quantitative analyses of the course statistics from the *Blackboard* platform as provided by the different course elements.

Course elements

Blackboard features a 'Course Statistics' functionality that records the number of times staff and students visit different course elements.

The communication elements include 'Discussion Board', 'Post Message', 'Send Email', 'Chat' and 'Group Pages'. The 'Post Message' facility allows staff and students to *initiate* comments within a forum in the Discussion Board or *reply* to a post made by another course participant. The 'Send Email' facility allows staff and students to send emails to single users, groups, or all users. 'Chat' is a synchronous facility providing a 'virtual classroom' where staff and students can organise real-time discussion, conducted by way of text transfer and graphics viewed on a whiteboard. 'Group Pages' provides groups (established by staff) with a space with its own Discussion Board, virtual classroom, email and file transfer facilities.

The non-communication elements (administration/management and content) include 'Subject Introduction', 'Student Tools', 'Send File to Instructor', 'Assessment', 'Check Grade' (all used by students) and 'Announcements', 'Assessment', 'Create Group', 'Modify Group', 'Online Gradebook', 'Digital Drop Box' (all used by teachers and, except 'Assessment', not being available for students).

These statistics were used to describe the nature and intensity of teacher/student *engagement* with course elements. Actions taken outside the *Blackboard* environment (such as private emails, downloading of and interaction with course material, and web searches) have not been, and generally could not have been, included in the analyses.

Student engagement

All courses revealed similar overall patterns of student engagement. Most students regularly used the 'Discussion Board', visited the 'Study Material' (thankfully) and used the 'Student Tools'. Elements such as 'Subject Introduction', 'Student Homepage', 'Send File to Instructor', 'Assessment' and 'Check Grade' were visited only at particular times during the semester (for example, commencement of course, assignment feedback) and, therefore, had a lower number of student hits.

Student access, communicative and content engagement

The statistics demonstrated that students accessed the site throughout the semester each day of the week and every hour of the day, a genuine '24x7' operation, defined as *student access engagement*.

Student communicative engagement was a prominent feature of engagement, especially asynchronous forms of communication (discussion board, post message, email). Synchronous communication was not widely used. Hits on the 'Discussion Board' far exceeded those on other elements and hits on 'Study Material', defined as *student content engagement*, was approximately only a quarter of those on the 'Discussion Board'.

The content-communicative ratio for the eight courses ranged from 0.03 to 0.52, reflecting different content structures and course goals. For example, one course had little set content as students negotiated the development of a project proposal. Asynchronous communication represented a significant component of student communicative engagement and, even excluding the project course, was utilised between two and ten times more frequently than student content engagement. An aggregate of the eight courses indicated that communication between people (Discussion Board, Post Message, Send Email, Virtual Chat and Group Pages) accounted for approximately 80% of interaction, whereas interaction with content accounted for approximately only 20%. Even with the knowledge that content engagement may be underestimated, this provides insights into the way students used course elements.

Teacher engagement

The concept of *engagement* was also used to ascertain how staff used course elements. Generally, all courses revealed similar patterns. Most teachers used the 'Discussion Board', 'Announcements', 'Assessment', 'Gradebook' and 'Digital Drop Box', with 'Group Pages' and 'Chat' (the virtual classroom) being less used.

Teacher access, communicative and administrative engagement

The course statistics demonstrated that teachers, like students, accessed the site throughout the semester each day of the week and every hour of the day, a genuine '24x7' operation, defined for the purpose of this study as *teacher access engagement*.

'Administrative engagement' refers to teacher roles that have to do with organising student details and records (for example, assessment details), while the term 'communicative engagement' has been chosen to reflect the role of the teacher in communicating with students, but it encompasses an emerging management role for online teachers. Kimball (2001, p. 1) maintained that:

> In addition to managing the delivery of the content to their courses, faculty…must learn to manage a new set of variables which determine the extent to which their courses are effective including: metaphor, meaning, culture, roles, time, awareness and collaboration.

While the statistics revealed differences between teachers in the way they used the online environment. in all courses, use of the Discussion Board, a component of *teacher*

communicative engagement, was high. The average use of the 'Discussion Board' was higher than all other aspects of communicative engagement; it was approximately 80 times greater than the use of the 'Virtual Classroom' (synchronous communication) and approximately 135 times greater than the use of 'Group Pages'. Very little use was made of facilities that promoted interaction synchronously. Teachers utilised the other interactive features of communicative engagement, that is, 'Post Messages' and 'Send Email', but these were respectively used approximately 7 and 9 times less frequently than the 'Discussion Board'.

The only other features used extensively, referred to as *teacher administrative engagement*, were the 'Assessment' features ('Gradebook' and 'Digital Dropbox') that allowed teachers to record student results and receive and return student assessment items.

Asynchronous engagement ratio

The *asynchronous engagement ratio* (AER) is a way of describing the different rates of asynchronous engagement between teachers and students as defined by participation on the 'Discussion Board'. The AER ranged from approximately one 'teacher posting' for ten 'student postings' to approximately one 'teacher posting' to three 'student postings'. This points to significant differences in the levels of teacher involvement. When combined with teacher postings per week, it provides further insights into teacher communicative engagement. Even though the teacher of one course had the highest AER (0.36), the number of posting per week was only 13. On the other hand, the teacher of another course had the second highest AER (0.26), but also had the highest number of postings per week (100).

With regard to the 'Post Message' facility, the AER ranged from approximately one 'teacher posting' for 32 'student postings' to approximately one 'teacher posting' to one 'student postings'.

Participation and grade performance

By examining the number of times individuals posted contributions within the Discussion Board, it is possible to differentiate between numbers of students who 'visited' the Discussion Board to read posts and those who visited it to read and reply to posts or initiate new 'threads' of dialogues. This was used to generate 'participation profiles' for individual students.

Three subgroups were derived—Proactive, Peripheral and Parsimonious (Taylor 2002, p. 7). The differentiation of these groups was undertaken in a relative arbitrary manner following the procedure outlined by Taylor. Taylor defined the Proactive Participation Group as those students who contributed an above average number of postings to the discussion board and students in this group were often among the first to post a message and to respond quickly to other messages, often creating 'threads' of ongoing dialogue between students. He described the Peripheral Participation Group as those who contributed less then the average number of postings to the Discussion Board, but participated regularly in the discussion in 'read only' mode. Students in the Parsimonious Participation Group contributed less than one third of the average number of postings to the Discussion Board and visited this feature less then fifty percent of the group average.

The different levels of participation appeared to be linked to academic performance. In all courses except one, the Grade Point Average (GPA) for students classified as 'proactive' was higher than the GPAs for other participants (the numbers in the exception were too small to attach significance to this anomaly), Students in the majority of courses, who had a parsimonious approach to engagement, received lower grades.

Further research is needed in order to understand the reasons for varying degrees of engagement and the perceived value of these interactions. This might begin to define the parameters associated with 'minimal and optimal levels of participation that will provide students with a reasonable chance of academic success' (Taylor 2002, p. 9).

Discussion

The introduction of online education produced anomalous conditions, that is, a violation of student and teacher expectations surrounding teaching and learning as they have come to know it. These relate to treatment of content, managing interaction, and variable interaction.

Treatment of content

The very high teacher and student communicative engagement, compared with content engagement, suggests that a significant percentage of course content may be generated through communicative interaction.

It is possible that 'content-heavy' courses may not be appropriate for the online environment if communication is viewed as a crucial component of the pedagogy. However, as there was no obvious relationship between content heavy courses and other types of courses with regard to student grades, and as the qualitative analyses indicated that students had an ambivalent reaction to the advantages and disadvantages of print-based material, it may be the case that content heavy courses are more suited to independent as opposed to interactive or collaborative learners (Postle and Sturman 2000).

Another interpretation of the differences in communicative engagement across courses might be the nature of knowledge structures inherent in these courses. Taylor (1994) suggested that expertise is identified with mastery of a range of knowledge structures (item specific, relational, strategic, empirical and affective). Both item-specific and relational knowledge structures are generally associated with early levels of expertise where learners are becoming familiar with knowledge/content structures. Strategic, empirical and affective, on the other hand, are generally associated with more advanced levels of expertise. The content in the different courses in this study may reflect these differences that in turn may affect communicative engagement; early levels of expertise may lead to more tentative approaches to communication as defined in the online environment.

Managing interaction

Students and staff working in the online environment were operating outside of traditional temporal norms. The 9 to 5 day, Monday to Friday had been replaced with a 24-hour day Monday to Sunday. Staff management of interaction has become a central issue in the online environment.

Variable interaction

While asynchronous communication was heavily utilised, usage was variable for students and teachers. Some students seized the opportunity for interaction with staff and their fellow students while others did not. The categorisation of learner types identified by Postle and Sturman (2000) suggests that the 'one type fits all' approach to online education would be simplistic.

With regard to staff variability, we have mentioned the possibility of content differences in courses; however, it is also possible that there are the beginnings of informal protocols emerging that control the extent of interaction that a lecturer is prepared to manage.

Conclusion

USQ's move from Placed-Based and Mixed Mode education to Flexible Delivery has seen substantial changes to teaching and learning. Asynchronous communication has emerged as the central component of teacher and student engagement with implications for each partner in the learning process.

Lecturers are operating outside standard teaching times because of the 'immediacy' allowed in the online environment, and are coping with large quantities of print-based discussion

board postings. They have become 'managers' of learning as well as partners in the learning process. What this paper has not addressed are the 'coping strategies' emerging because of these influences and the differences between lecturers in these strategies, in part because of their different experiences—some have been used to verbal communication that is typical of Place-Based education while others have been accustomed to traditional distance education with its emphasis on written communication. The concept of 'teaching style' may be important when staff attitudes to online education are assessed.

Changes have been equally critical for students. They have generally taken advantage of the immediacy of online education and its capacity for social and intellectual engagement, but the nature of that interaction, and attitudes towards it, may, like teaching styles, be affected by learning styles. There is nothing to suggest that the quality of education is diminished through online approaches, but the research has not established whether different course content structures are important determinants of success.

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