FACILITATING ONLINE INTERACTIVITY AMONG REMOTELY LOCATED LAND MANAGEMENT STUDENTS

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Abstract

Distance education holds particular potential for the area of land management education in Australia, where students are usually working in the field and are often located in remote locations with restricted opportunity for interaction with staff and other students. This paper contains preliminary observations on the role of Web fora to improve interactivity for distance education (DE) students and thereby enhance learning. Educational benefits and problems are discussed and measures suggested to achieve learning potentials, using as example a unit of study undertaken by DE students enrolled in the Bachelor of Land Management through The University of Sydney in Australia.

Introduction

Conventional thinking assumes that university trained land managers study full-time on campus due to the 'hands on' nature of such programs. Such thinking confuses education, which is a process, with place. Provided the educational process is effective, and timetabling constraints are minimised, then place becomes irrelevant and the educational catchment is extended to include even those in very remote locations with unpredictable working hours. It is recognised, however that learning is best achieved in social settings and that discourse can significantly influence the level and forms of learning achieved (Vygotsky, 1978). For this reason, DE is often seen as a second-rate alternative (ABC, 2001).

Interactivity can be defined as 'the manner in which the learner dialogues with him/herself, with materials, or people during learning's mental activity' (Baker-Albaugh, 1993 p.36). Clearly it is not easy for DE students to interact with each other (Davie, 1988) and the social side of DE has been neglected, putting those students at a disadvantage (Muirhead, 2000). Milheim (1996) has reviewed the literature on interactivity within a computer-based education strategy and concludes that it is *the* most important element in instructional design. It increases the students' interest; it improves cognitive processes; and it develops group learning skills (Baker-Albaugh, 1993). More precisely, the benefits include a better understanding of different perspectives; an ability to compare progress (and mistakes) with others and with set standards; opportunities for reflection; and a deeper engagement with the topic through interaction with other learners and teachers (Gibbs, 1992; Petre *et al.*, 1998). One of the key advantages is that the student no longer feels alone, but is part of a community of students that also has problems and fears (Salmon, 2000b; Bates, 1986).

Is it possible to improve interactivity for remotely located DE students? Can we do this through changing the teaching approach so that each of these otherwise isolated students regards themselves as a component of a

cohesive group involving themselves with other students and the tutor, and, if so, must groups always act in real-time as suggested by Sir John Daniel (1998)? Audio-conferences and residential schools can provide real-time group teaching, but are not always feasible options. What is needed is a model of group interactivity that does not require everyone to be in the same place at the same time; to give that element of flexibility needed by DE students.

The Web can overcome many of these obstacles for DE students in many disciplines (e.g. Gilmer, 1999), through the availability of asynchronous web fora. The educational advantages and feasibility of online learning have been reviewed by, among others, Laurillard (1993); McArthur and Lewis (1997); Harlamert (1998); Hughes and Hewson (1998); Petre *et al.* (1998); Stratfold (1998) and Muirhead (2000). It has been argued (Jonassen, 1995; Papert, 1980) that computer technology has the potential to facilitate powerful learning not easily replicated in other learning environments. Many of the benefits are similar to those of interactivity itself and it is important to understand that it is the educational processes that provide the benefit, not the tools themselves (Baker-Albaugh, 1993; McArthur & Lewis, 1997). For example, a deeper approach to learning is encouraged through active participation in an appropriate context (Biggs, 1987). The actively involved student is engaged in questioning and processing to a degree rarely found in the passive learner and is expected to think critically, creatively and reflectively (Savery and Duffy, 1996).

Asynchronous Web fora can provide the convenience and flexibility for students who live in remote areas, have time constraints or are working full-time (Davie, 1988; Harlamert, 1998; Petre *et al*., 1998; Muirhead, 2000) or due to the nature of their employment (e.g. fire-fighting) keep very unpredictable hours. They may lack the free-flowing discussion of synchronous tutorials (Hughes & Hewson, 1998) and there is evidence that students prefer immediate, or at least same day, feedback (Davie, 1988). The delay may be an advantage, however, as it provides time for reflection prior to response (Barnes, 2000) and may improve communication overall (Sherry, 1995).

While opportunities exist for educators to enhance their programs by utilising the Web, and early results are generally positive both in respect of the quantity and quality of responses in interactive fora (Muirhead, 2000), Hara and Kling (1999) caution about only examining the virtues of this medium. Their research has exposed the potential of Web delivery to frustrate students. Frustration interferes with pursuing goals (Reber, 1985), and it demotivates, thus detracting from learning (Jonassen and Grabowski, 1995).

Frustration can occur when students fall behind and may be overwhelmed with messages when re-engaging (Stratfold, 1998). Slow feedback and lack of non-verbal cues may also lead to frustration and/or hostility (Horn, 1994; Tolley, 2000). Frustration can also be caused by lack of sensitivity to the needs of learners, which may not have been taken into account in the rush to embrace the new technology (Sherry, 1995; Salmon, 2000a). Insensitivity to

student diversity can also be a block to learning (Boud *et al.*, 1985). Contrasting personality types require different teaching strategies. Some prefer to learn in an independent situation and others prefer a more collaborative style (Jonassen & Grabowski, 1995) and certain courses may need different approaches (Linich, 1999).

Successful online strategies require students to be comfortable with the technology (Bates, 1986); be prepared to take more responsibility for discovery; and be highly motivated (Harlamert, 1998). Getting DE students to interact online is a very challenging task (Stratfold, 1998). Students that are motivated, organised and possess the ability to write effectively are more likely to take advantage of the opportunities for the interaction online courses can provide (Davie, 1988).

Students may resist new technology because it is seen as 'experimental' (Laurillard, 1993). Moreover, for it to be successful, students need to go beyond the questioning stage and to have the confidence to expose their ideas and reflections to others (Barnes, 2000), and this may be quite challenging. Of greater concern, students may perceive the knowledge to be peripheral to their main studies (Laurillard, 1993; Forsyth, 1996;). Milheim (1996) suggests that interactivity can be improved by ensuring relevance to students' needs and by offering some type of reward, such as through credits. However, it has been shown that even where participation is graded, postings to Web fora can fade over time (Muirhead, 2000).

The arguments about improved learning outcomes using online teaching strategies have not always been validated. Some trials using these technologies have not used appropriate evaluation tools and there has been confusion between student *reactions* and learning (Alexander, 1999). Furthermore, many of the studies have contrasted face-to-face with online learning (Hughes & Hewson, 1998; Petre *et al.*, 1998) and these are unfair comparisons as DE students receive little or no face-to-face teaching, and for them Web discussions may be their *only* opportunity for social interaction.

Case study

The Faculty of Rural Management within the University of Sydney has gradually introduced the Web conferencing software WebCT to all DE units of study over the last few years. The unit under discussion – a third year (equivalent) unit *Land Use and Management Planning* – utilised this medium during 2000 and 2001. The numbers of students enrolled in these unit presentations were very low: 12 in 2000 and 16 in 2001. The primary teaching strategy was through printed learning guides. These permit some interaction between the student and the learning materials, but these activities are limited and probably under utilised. The unit also has an audio-conference, but no residential school (due to low enrolments).

Objectives

There were several intentions behind utilising the WebCT platform and these included reducing student feelings of isolation and increasing interactivity

between students. Additionally there was an objective to lift the level of academic achievement from one of *situated learning,* where learning happens in the context of a particular situation, to one of *mediated learning*, whereby students go beyond specific situations and examples in order to reflect on a concept to enable them to see it in their own way, and help them 'change the way they experience the world' (Laurillard, 1993). This is illustrated in Figure 1. The strategies and pathways that presently predominate in the Faculty are shown on the left and those of a higher academic level on the right of the diagram.

The desired outcome is an amalgam of both strategies, so that students are not only capable of applying knowledge of their discipline in context, but can also go one step further and be able to abstract from the particular. If this is achieved then that understanding can be used in other situations as the student is able to move the application from the particular to the general (Laurillard, 1993). This could be seen to equate with *extended abstract*, the highest level of engagement with the content in the SOLO (Structure of the Observed Learning Outcomes) learning taxonomy (Biggs, 1999).

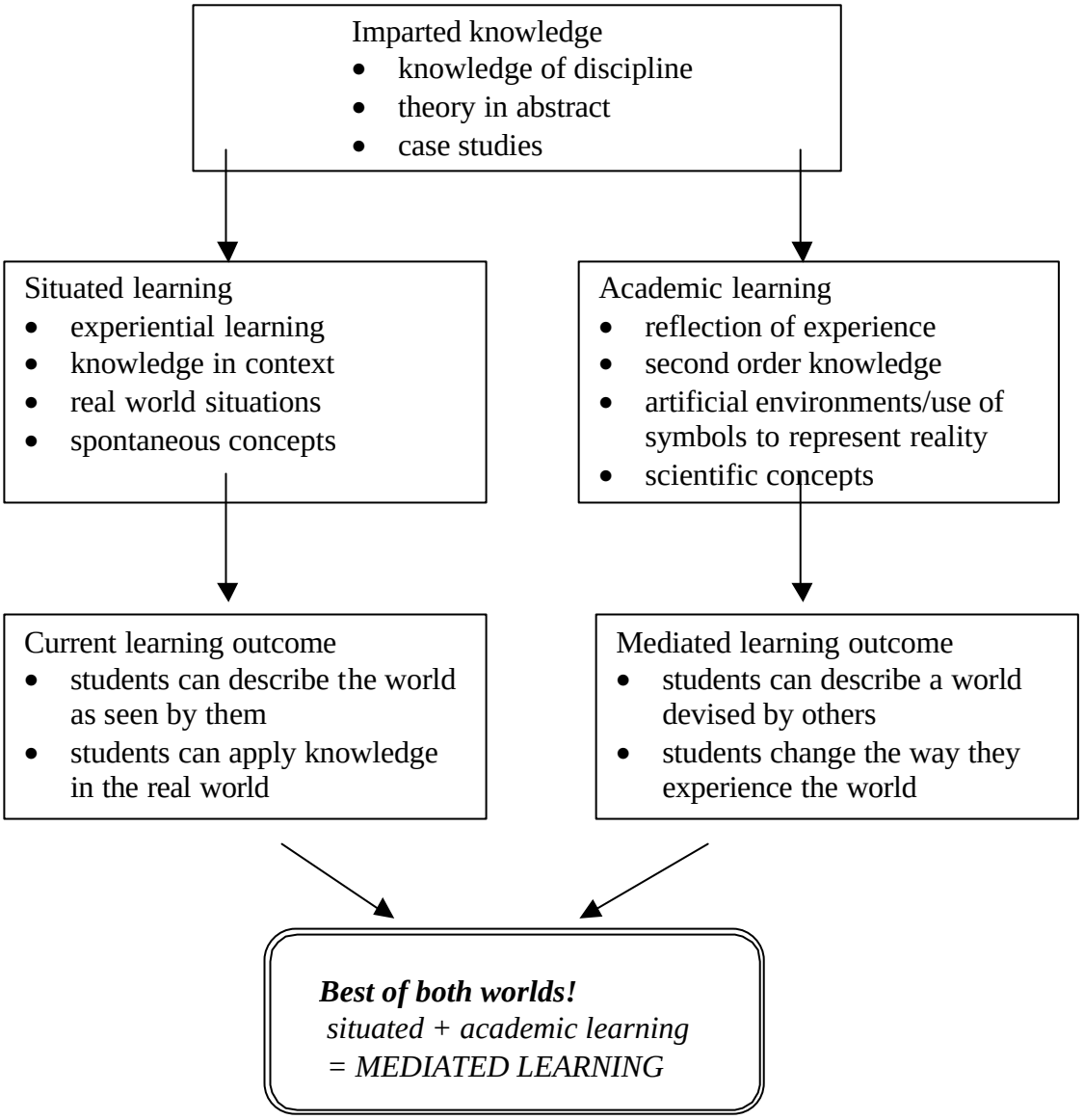

Figure 1 Learning strategies and pathways: current and desired

Source: adapted from Laurillard (1993)

WebCT activities

Student preparation for Web-enhanced learning in both years included a letter which outlined the technical information needed, the program of activities and the educational benefits of the WebCT platform. These were reinforced during an audioconference held at the beginning of semester.

In both years, participation was voluntary as not all students had reliable Web access. In 2000, no student assessment associated with their participation was undertaken, but in 2001 a system was introduced involving assessment choice and this incorporated an opportunity to receive credit associated with participation. This was prompted by feedback received from non-participating students in 2000, and supported by Boud *et al.*'s claim that academic effort in this area should be rewarded (Boud *et al.,* 1999). Busy DE students need a very good reason to participate in optional activities (Salmon, 2000b). Boud *et al.* (1999) suggested that a credit of <20% may not be taken seriously, but when given the choice, all participating students selected a 10% weighting, probably because they were uncertain about the process and outcome. Additionally, they all elected for the tutor to undertake the assessment, rather than using the alternatives offered of self and/or peer assessment.

In both years, the first Web activity was an 'ice-breaker' to introduce the students to each other and to the tutor; to get the ball rolling and 'humanise the process' (Petre *et al.*, 1998). After that activities were placed on the web fortnightly. The tutor added her own comments and responses at least weekly. The first formal activity for the 2001 group was to set the assessment criteria and, after being given some ideas, the list that they produced for their 10% was:

1. Commitment to undertaking the activities in a professional manner (1%)
2. Evidence of a supportive, positive and inquiring attitude to others' comments, whatever their level of experience and expertise (3%)
3. Adherence to timelines as set, or provision of reasons for non-adherence, preferably well in advance (3%)
4. Engagement with the content in a full and focussed manner (3%).

The other activities in both years included a discussion of different land use planning approaches, a reading and comprehension exercise (which they individually selected from the readings provided), a description of the process they used to make their planning decisions (this required a combination of reading and analytical techniques), and the final (but unassessed) task was to give feedback on the process. The activities were specifically designed to

encourage them engage more deeply with the unit's content and to help them achieve a better outcome with their written assignment work.

Evaluation

The tutor reviewed the success of the online initiative in both years by evaluating the approach used and participation that occurred against the Web discussion criteria of Stratfold (1998); with Salmon's (2000a) five stages of competence to online learning; with Muirhead's ideas for improving interactivity; and through student questionnaire and follow-up phone calls. A brief description of problem areas that were identified and how these were (and are still to be) rectified follows.

It was clear after the first year that considerable improvements were needed in the program. For example, one of Stratfold's (1998) criteria for Web discussions was that there should be a mechanism for guiding students through a unit, such as discussions are closed and new ones activated. This was a bit messy in 2000, but the mechanisms tightened in 2001 with the introduction of assessment (and its concomitant timelines). The discussion certainly proceeded at a more orderly pace and in a more focussed manner. There were also fewer problems with frustration at slow responses than in the previous year.

Interaction and collaboration with other people were inconsistent in both years. The depth of interaction increased in 2001 with the students being assessed on their engagement with the content. The students generally gave considerable thought to their responses and backed their statements up with evidence from their reading, but the level of participation did not increase. This may have been an unexpected outcome of the introduction of assessment, as those students who selected not to be assessed did not join in the discussions at all after they had made that decision. The reason for this has not yet been evaluated, but we suspect summative assessment may have given the activities a mantle of formality, which was not as obvious in the previous year. This can be addressed by providing a separate forum for non-assessable, and thereby less formal, discussion. The collaboration aspect has also been addressed through the introduction of a peer-mentoring program in future years.

The main gaps in our Web program, when evaluated against Salmon's (2000a) five stages of competence in online learning, were the lack of hands-on-tuition, lack of technical support after hours, and activities not being completed synchronously due to the Faculty's flexible timetable for unit completion. Students were also not given much opportunity for leadership and external links were not provided. Some of these were remedied in 2001 (e.g. the tasks were generally completed synchronously), but some problems were not tackled as they were not considered appropriate at this time.

After consideration of Muirhead's (2000) ideas for improving interactivity, some effort was made to improve this aspect in 2001. The questions were made more intellectually demanding, whilst trying to still be inclusive of all students. The tutor was also more visibly responsive and informative and

provided more student-centred activities. She did not try and make students accountable for weekly discussions, however, as this would have resulted in excess workload for the students.

An anonymous and voluntary student evaluation of the learning experience was also undertaken (Table 1), although in both years the response was very low: four in 2000 and three in 2001 (25%). While a higher response rate would have been welcomed, this response rate is in fact higher than the Faculty average received for DE student unit evaluations. While unable to comment on those who did not respond, for those who did respond it is clear that the experience was a positive one. They were generally comfortable with the technology and not intimidated by the process. There was a strong indication that the tutor's contributions were important. Many commented that, once they had overcome the initial technical hurdles, they found it helpful and they particularly liked to see viewpoints and ideas from students from different geographic regions and diverse backgrounds. Three of the students who were formally assessed in 2001 commented on the fact that the activities enhanced their learning and opened their mind to other aspects of the study that they may not have discovered otherwise.

Table 1 Responses to WebCT evaluation questionnaire

Responses are on a 5 point Likert scale: 1 = strongly agree; 5 = strongly disagree

Questions	**Mean**	**Responses**	**Range**
Access made to WebCT was every (no. of weeks)	1.43	7	1-2 wk
Access was made from home (h) or work (w)	5h 2w	7	NA
Enjoyed using technology	1.29	7	1-3
Level of support suitable	2.00	6	1-3
Enjoyed contact with other students	1.83	6	1-3
Found messages from tutor useful and motivating	1.33	6	1-3
Found messages from other students useful and motivating	2.00	6	1-3
Was embarrassed or nervous to post messages	4.17	6	3-5
Felt WebCT gave me a sense of continuity	2.00	6	1-3
Felt WebCT made the unit more enjoyable	2.00	6	1-3
Believe WebCT helped me through unit (2001 only)	2.00	3	2-2
Would like to see WebCT extended into more units	1.43	7	1-2
Would like to see WebCT extended into administration	1.43	7	1-2

Students who participated in the program generally obtained higher grades than non-participants did. However, little confidence can be put into this

evidence due to the tiny sample and the probability of confounding variables (e.g. the participants may have been better motivated and had a deeper approach to learning prior to commencement of the unit, so their participation might have made little difference to their final outcome).

Raising participation rates

One interpretation of the results reported above is that there should be a continuing endeavour to have more students participate online. Whilst acknowledging the difficulties in raising active participation rates, remedial strategies include lifting the standard of the fora themselves, using assessment as a means of encouragement; and providing a diversity of activities. In respect of the Web fora, Tolley (2000) suggests that it is important to ensure that no-one is excluded by the level (or language) of the debate and to keep the dialogue flowing, even if it is only with one student. Tutors can also find out who is reading, but not posting, and solicit responses directly from those students (e.g. by private email), whilst being aware that there is some educational benefit for those who only participate by reading others' comments (Farrell, 2001).

Fora could be improved by making them more student-centred, intellectually demanding and relevant (Boorsook & Higginbotham-Wheat, 1991), without being too onerous. The facilitator needs to be a 'role model' and encourage discussion (Davie, 1988). He or she needs to go beyond summarising content of messages, but should relate them to the unit's content, theory and practice (Salmon, 2000b). Wider use should be made of the Web's resources (Oliver *et al.*, 1999) and of WebCT tools, such as the virtual whiteboard and private fora for groupwork and peer-mentoring.

In the unit discussed, the main inducement, apart from offering credit, was to try and persuade the students not to look upon their participation as additional workload, but as a means of complementing and raising the standard of their assignment work. Unfortunately this did not seem to be particularly effective. In the next offering of the unit, students will be given the option of assessable participation or completion of an alternative task of equivalent workload offline. Although this strategy could be seen as introducing an undesirable compliance tool (Boud et al., 1999), and may lead to complications if the technology fails to provide continuity, it is likely to be acceptable to DE students, many of whom have adapted to an assignment-driven curriculum as a survival mechanism.

For the next offering, the assessment will be similar to 2001, with refinements. Early activities will be designed to ensure students are comfortable with the medium, followed by more sophisticated, content-related tasks mid-semester, leading to the later stages where a constructivist approach to learning should be adopted. This should benefit our students due to their considerable prior learning, an understanding of which is a requirement for constructing new meaning (Salmon, 2000b). In addition, better feedback will be given to the students as they progress through each milestone (Farrell, 2001).

The students will set some of the marking criteria, but some will be non-negotiable to ensure that they are congruent with the unit learning objectives and SOLO principles, and to aid the move from situated to mediated learning. Self-assessment, with 'informed opinion from peers' will be trailed, as recommended by Boud *et al.* (1999) to develop autonomous learning skills. While mature age students sometimes assess themselves at a lower level than is justified (pers. obs.), if it stressed that it is the level of *improvement* in the approach to learning that is important, and this is backed up by anonymous peer review, it is expected that self-assessment should be acceptable.

Another way to improve interactivity is to diversify the types of activities planned and many strategies are suggested in the literature (see, for example, Farrell (2001) and Muirhead (2000)). Problem-solving workshops could be very useful, particularly where real life simulations were used (Oliver *et al.*, 1999) as part of the transition from situated to mediated learning. These should be considered once the culture of online learning is more widespread.

Another option is that of peer mentoring, which seems to offer the best of the benefits of online learning – interactivity as well as the valuable tool of mentoring (Topping, 1996). The learning pairs would not work in total isolation from the rest of the class, but would report back their findings at regular intervals, so that all students benefit. This would be based on problem-solving and 'structured controversy' (Johnson & Johnson, 1988) to improve critical thinking skills, with pairs working on a particular problem or issue together, then reporting back to the main group.

Future evaluation

Incorporation of evaluations of these changes to teaching strategy is critical if the Faculty aims to improve the quality of teaching (Milheim, 1996). The tutor should therefore:

- monitor and analyse participation using tracking and other tools as described by Davie (1988); Muirhead (2000) and Salmon (2000b)
- participate in WebCT discussion with colleagues to share new ideas and to seek changes to teaching strategies
- compare performance of students (grades, self and peer assessment output) at various levels of participation to identify trends
- use self-reporting questionnaires and online discussion of the Web program to gain insight into how the process can be improved and aid student understanding of the process of learning online (Salmon, 2000b).

Conclusion

Opportunities for practising land managers to participate in high quality education programs are improving, as these programs become widespread. Evolving delivery technologies are enabling the potential student, regardless of location, age, work or domestic commitments to participate in formal courses. As the aim is to encourage students to move to mediated learning, without

losing their ability to achieve situated learning, then participation in computer-based discussion groups and learning partners can provide useful tools.

Whilst there may be evidence that improvements in student learning can be achieved, will the students perceive the benefits in time to take advantage of them in a semester? We should be optimistic and anticipate that, as Stratfold (1998) suggests, students will use this technology when they perceive the benefits - improved learning, flexibility, contact with peers and tutors, and access to the Web resources. Once there is institution-wide acceptance, there is also a stronger likelihood of dialogue taking place and this may lead to an increase in student numbers, which will further enhance interactivity (Daniel, 1997). Many challenges remain: for example the timing of the delivery needs to become more flexible – unconstrained by administrative boundaries and more student-centred. However, even within the current constraints, if adequate planning is undertaken and sufficient attention given to improving student learning and interaction, we are confident that the medium can bring immense benefits to both the institution and to its teachers and students.

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