

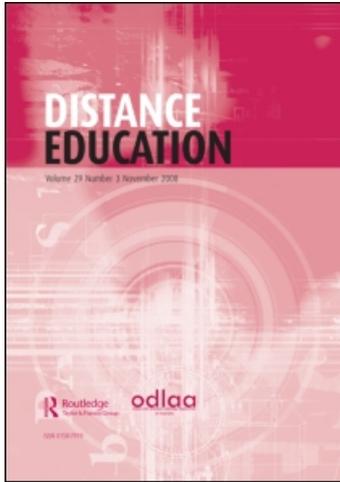
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Lisa Lobry de Bruyn^a

^a University of New England, Australia

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Monitoring Online Communication: Can the development of convergence and social presence indicate an interactive learning environment?

Lisa Lobry de Bruyn*
University of New England, Australia

More units of study are being offered flexibly, using distance education and online facilities, as a consequence of recent educational developments in higher education, with learner expectations of being able to study when they like and where they like, as well as increasing class enrolments and more students studying remotely or part-time. However, the quality of the learning experience and the efficacy of placing learning activities that require student interaction and discourse in an online environment have been questioned. The concerns raised by educators regarding placing learning activities online are often about the types of learning environments that are being created and the tools available to support student communication in a virtual learning environment. Asynchronous computer-mediated communication is one means of allowing students to communicate independently of time and place, and to communicate questions, opinions and queries when transferring interactive learning activities to an online environment. The use of threaded, online discussions that allow asynchronous communication has been criticised for not producing the perceived benefits for learners and educators. This paper assesses the use of asynchronous computer-mediated communication and the degree of convergence and level of social presence as indicators of developing highly responsive and interactive learning environments in the context of an inquiry-based learning activity, using a case study approach with problem solving and self-directed research.

Introduction

The combination of online delivery with interactive learning activities requiring student–student interaction is providing students with opportunities to develop a range of skills and competencies (personal, people and professional) along with the knowledge base to support them so that they are able to demonstrate

*School of Environmental Science and Natural Resources Management, University of New England, Armidale, NSW 2351, Australia. Email: llobryde@metz.une.edu.au

achievement when they enter the workplace. Inquiry-based learning¹ activities (Feletti, 1993; Mahony, Wozniak, Everingham, Reid, & Poulos, 2003) using a case study approach with problem solving and self-directed research, delivered online, constitute a learning approach that can support knowledge acquisition to actively engage students in the learning process, and enable students to develop and strengthen their competencies in the areas of information literacy, communication, self-directed learning, and solving “real-world” problems (Boud & Feletti, 1997). Furthermore, online delivery of interactive learning activities offers those students learning remotely the ability to communicate asynchronously with other students; to brainstorm, analyse and redefine the issues in relation to the inquiry-based learning activity and engage in social interaction. Nevertheless, there remains some uncertainty among learners and educators about how well interactive inquiry-based learning activities and online delivery can be combined.

Since communication amongst peers is an integral part of creating an interactive learning environment, this study focused on the capacity of asynchronous computer-mediated communication to support discussion within the context of an interactive inquiry-based learning activity delivered online to off-campus students. To evaluate the development of a highly responsive learning environment two indicators were chosen: (a) degree of convergence and (b) level of social presence. These two indicators were used to analyse electronically archived threaded online discussions. The data that were used had been collected, over 2 years (2001, 2002), from students undertaking an undergraduate university unit on “Land Degradation and Land Evaluation.”

This paper is based on an earlier paper delivered at the 16th ODLAA Biennial Forum (Lobry de Bruyn, 2003) and incorporates ideas that originated from input from and discussion with Forum participants.

Background to the Study

The literature review examines the benefits and drawbacks of using asynchronous computer-mediated communication to provide an interactive learning environment in the context of the delivery and exploration of an interactive inquiry-based learning activity in an online environment. Normally in a classroom environment the various steps of the problem-solving process are conducted face to face in small groups: introducing each other, setting ground rules, acknowledging prior learning, identifying contributions to group learning, identifying learning needs and activities, and finally working through the problem-solving process. When the problem-solving process is transferred to an online environment, asynchronous computer-mediated communication allows students to communicate independently of time and place, and even allows small groups to be created to communicate questions, opinions and queries. The use of threaded online discussions that allow asynchronous communication will be advantageous when the times at which students will want to access the online discussion are not able to be predicted. Threading

allows students to trace and keep track of conversational chains, as each note has a subject label, and is organised in a hierarchical structure that includes only those messages that are related. Unrelated threads are kept separate, and this allows students to pursue multiple avenues of thought without becoming confused (Hewitt, 2001). It is worth noting, though, that Hewitt (2003) also discovered that students are more likely to read the latest thread than read earlier threads.

The literature examining the use of asynchronous computer-mediated communication for supporting online learning activities cites a number of advantages (Harasim, Hiltz, Teles, & Turoff, 1998; Hewitt, 2001; Mason & Kaye, 1989, 1990). These include:

- *Connectivity and accessibility.* There is increased group interaction since the discussions are open and not limited to face-to-face meeting times. Also, the collective knowledge of the class and external online resources are more accessible to students (Eastmond, 1994).
- *Equitable communication* between students is encouraged as there is no need for “turn taking” (Graddol, 1989) and everyone can be “heard,” including the more reticent students, without being intimidated by more vocal students.
- *Student reflection* is also fostered through messages being preserved electronically; messages can be revisited and reread; and students having “time for reflection before they commit their ideas to public scrutiny” (Mason & Kaye, 1990).
- Student conversations using asynchronous computer-mediated communication are *boundless* in time and space, which promotes greater student interaction. Also, because time and location are not restricting communication, the instructor can expect all students to contribute to discussions.

Online communication facilities offer the promise of increased student interactivity and accessibility. Yet many difficulties may be encountered when using asynchronous computer-mediated communication (Guzdial & Turns, 2000; Harasim et al., 1998; Light & Light, 1999). These originate from the lack of student initiative in discussions, limited student discourse on learning issues, and student preference for “face-to-face” learning. Such factors include:

- *Technical difficulties* associated with access to computer software or hardware.
- *Communication anxiety*, accentuated when student/instructor responses are not immediate. Also, students who are new to the online environment may be reluctant to join in the conversation in case they say something silly, out of place, or poorly presented; and, because postings cannot be erased, students are concerned about the permanency of an ill-conceived message, and how it will be perceived by other students and the instructor.
- *Lack of social presence*, because the medium does not allow for social cues, especially those which are non-verbal and which, if available, would lead to greater immediacy, and hence more intense, affective and immediate interac-

tion between students and teacher (Rourke, Anderson, Garrison, & Archer, 1999; Stacey, 2002).

- Limited *student interaction*, either because the learning environment does not motivate students to interact as it does not rely on confidence or attention-getting skills, or because of low student confidence in what they may want to say, is not important or contributing anything new to the discussion (Guzdial & Turns, 2000).
- The lack of support for *convergent processes* (e.g., analysing and synthesising) (Hewitt, 2001).
- *Time management*. This is often necessary as the time spent online can easily exceed the time spent in face-to-face classes, since online discussions are boundless (in relation to time and location) and are typically always open.
- *Information overload*. This can occur as a result of the amount of information, and the additional information to which students are guided by links to other material, thus overwhelming students to the point of torpor.
- *Misconceptions*. These can occur when students receive no clear feedback to indicate whether their point is clear, and this situation is further compounded by “learner reluctance to push peer thinking and understanding” (Hewitt, 2003).
- *Traditional roles*. These are often maintained: “the student speaks, the teacher answers, confirms, approves and reinforces” (Henri, 1995, p. 158, quoted in Light & Light, 1999).

Context of Research

This present study evaluated the nature and use of asynchronous computer-mediated communication over the 2 years 2001–2002, concentrating on those students learning off-campus, in the context of an interactive inquiry-based learning activity delivered online in a third-year university unit titled “Land Evaluation and Land Degradation.” The unit is taught to a mixed degree, dual-mode (on- and off-campus) student cohort, and utilises teaching materials delivered both in hard copy and online. Characteristically, the off-campus students were mature-age and currently employed, and most were undertaking the unit at Bachelor’s and Graduate Diploma level with a small proportion at Master’s level. The gender ratio of off-campus students in both years (2001, 2002) was skewed in favour of male students (mean of both years, 61%), compared with female students (mean of both years, 39%).

The use of technology such as computer conferencing and the Internet to locate information and teaching materials available online was designed to enhance the learning experience of students undertaking the unit. The interactive inquiry-based learning activity, with off-campus students, was first tested in 2000 with a small group of students who chose the alternative assessment ($n = 12$), while on-campus students have been undertaking similar activities since 1999. In the following years (2001, 2002) the online, interac-

tive, inquiry-based learning activity was made a compulsory part of the unit assessment, with all students required to participate.

The online inquiry-based learning activity in the “Land Evaluation and Land Degradation” unit with off-campus students was applied in the following way. Scenarios (re-titled “situation statements” in 2002) were introduced to the students in weeks 1, 4 and 10 of the semester via the online unit home page, or supplied as hard copy within the unit handbook. The scenarios or situation statements were structured around the unit curriculum which focuses on identification and causes of and solutions to land degradation problems, and the concepts and practices involved in land use planning. Before the commencement of the inquiry-based learning activity, introductory notes on the approach were supplied to each student (available online and in hard copy). These included information about the learning approach, how it differed from more traditional forms of teaching and learning, and how it would be delivered and executed in the unit. The inquiry-based learning activity was completed in three stages: stages 1 and 2 (contributing 30% to the unit grade) were submitted together two-thirds (week 9) through the semester, while stage 3 (contributing 30% to the unit grade) was submitted at the end of the semester (week 13). The problem-solving part of the learning activity was interactive and undertaken as a collective, while the written response (which was assessed, and informed from the online discussions) was an individual student responsibility. The reason for treating the off-campus students as a collective was largely for logistical reasons and because it was not possible to place students into smaller groups at the beginning of the unit as their commitment to continuing with the unit had yet to be confirmed. The learning outcomes of the interactive inquiry-based activity were to create the opportunity for individual students to:

- (a) review and think critically about the information in the content areas in question;
- (b) demonstrate that they can access up-to-date, relevant and informative information about the content areas in question;
- (c) interpret and interrogate information they have collected and form their own opinion, and follow-up questions in relation to the content area in question;
- (d) deliver a written response that demonstrates a high degree of synthesis and analysis of the relevant content area;
- (e) within the written response supply evidence that demonstrates that they have understood the content area and have critically evaluated information used in the written response (i.e., they are able to judge its level of reliability and worth);
- (f) produce a written response that can be easily read and understood by a wide audience; and
- (g) reflect on learning arising from the process of composing the written answer.

Assessment of student performance was based on the above learning outcomes and built into a criterion-referenced framework using a marking schedule.

The structured learning guide (see the Appendix) was designed to offer students an approach to solving the situation and developing skills in problem solving and independent research. The structured learning guide was particularly useful for scaffolding students unfamiliar with the approach and giving them clear indicators of when their involvement in online discussions was required, and explaining the nature of the activity. For instance, students would need to be able to formulate and communicate questions in response to the situation statements as well as respond to questions posted by students on the online discussions at designated times. Students made use of the technology by participating in online discussions using WebCT™, especially for the problem-solving part of the inquiry-based learning activity, as well as engaging in self-directed learning (i.e., reading and research), using either the online teaching material or material obtained independently via the Internet. Instructor involvement in online discussions was timely and strategic. Due to the large number of students enrolled in the unit (usually 70), instructor responses would be posted to the student collective weekly in the online discussions and there would be discretionary responses to individual postings, especially if the collective response was inadequate. In the online discussions, a week after, they were introduced to the situation statement as “meet the situation,” and in response to student questions the instructor posted a four-page rejoinder electronically and by mail that attempted to “flesh out” the answers to most of the student questions communicated over the previous week in the online discussions with information, arranged in a conversational reply. As a preface to the rejoinder, all the student questions were collated and tabulated indicating their nature, frequency and the number of students participating. To give meaning to the information supplied in online teaching materials or in the rejoinder, students were encouraged by the instructor in the online discussions to conduct further research and reading.

Research Approach

Working with on-campus students, the learning environment for the inquiry-based learning activity was typically characterised by students working in small groups, interacting and discussing issues face to face in a classroom. This study sought to examine the ability of online communication to build an interactive learning environment that would support student-centred learning and student mastery in the context of an inquiry-based learning activity where the initial student discussions of the online situation statements were able to occur only via asynchronous computer-mediated communications. This paper specifically focuses on the degree of convergent processes (i.e., degree of analysis, synthesis, and summarising) and level of social presence² identified in the content of student postings of 25 and 30 student participants (in 2001 and 2002, respectively) as indicators of the development of an interactive learning en-

vironment. The data were gathered electronically and archived from online discussion postings for stage 1 of an inquiry-based learning activity over a 2-week period at the beginning of the unit in 2001 and 2002. The analysis presented here consisted of evaluation of student use of the online discussion facility, and content analysis on individual student postings for the presence of text that could be coded using the following content analysis schemes. The unit of analysis at this stage was an individual posting, and therefore this study, as yet, has not examined the frequency of social presence within an individual posting or across postings, just the presence or absence of defined categories. Hence, a student posting could be coded several times under different categories. The content analysis schemes by Stacey (2002) and Rourke et al. (1999) were used for defining and measuring social presence, while the scheme developed by Hewitt (2001) was used to examine the level of convergence occurring in postings (see footnotes to Tables 2 and 3 for a more detailed definition of content analysis terms).

The following is an example of how electronically preserved student postings can be coded for social presence: “**bold**” for affective responses, “*italics*” for interactive responses and “underline” for cohesive responses. Please note that student names have been altered to preserve their anonymity, and grammar has not been corrected.

Hi all. sorry for my quiet, I've been in the field for the last 10 days, and no access to a server (in some ways that's been a real treat!). I was glad to see, yesterday, that I'm not the only one wondering where this is heading. I'll add my 20cents worth, although I really like the table format that Connie put together as a way to see the links more clearly, so im gonna do the same and post it later. In the interim, I agree with most comments so far. i agree with Sue and Gary, there is a need to look at scale, especially the paddock/farm scale as well as the landscape and catchment scales. ... Anyway, I won't put much detail in the following comments, as they ...

[68 lines of text relating to cognitive matters]

*... So I will take advice from the others on that one. **That didn't turn out to be brief at all!!!**. I don't even know if it makes sense, but thanks for listening.
Cheers Greg.*

Research Findings

The notion of creating small groups of students as active, reflective participants in an electronically linked learning environment is the ideal but not necessarily the reality. It seems that those researchers who report positive outcomes using an electronic learning environment for student interactive learning activities are using it in addition to, rather than instead of, face-to-face sessions (Ronteltap & Eurelings, 2002). The instructor's experience of creating a sense of learning communities within an electronic environment (online threaded discussions using WebCT™) within the context of an inquiry-based learning activity en-

countered difficulties, especially with those students unfamiliar with the learning strategy and/or the online learning environment.

Tables 1, 2 and 3 compare the student online discussion postings of 25 and 30 student participants, in 2001 and 2002, respectively, for stage 1 of the inquiry-based learning activity. Despite improvements, in the volume of student postings (up by 30%), and student repeat postings (up by 55%), in 2002, compared with the previous year the proportion of students participating in asynchronous computer-mediated communication remained around 40% of the off-campus student cohort for both years (see Table 1). One particular reason for low rates of student participation in online discussions was that 45% of the off-campus student cohort had restricted Internet access. Another reason for low levels of student activity in online discussions was that although students' involvement in online discussions was supported and guided by the instructor through participation in online discussions (offering advice, collating and responding to student questions), it could have been enhanced had greater instructor moderation or modelling of behaviours occurred. Rates of student participation in online discussions could also have been higher had the activity been made an assessable component of the learning activity or participation in online discussions been made compulsory to receive a final grade in the unit. For equity reasons (i.e., access to the Internet) this strategy of increasing student involvement was not pursued. Nevertheless, student motivation to become involved in online discussions was considered to be self-rewarding, as it provided significant assistance to the problem-solving aspects of the learning activity (see the Appendix), and hence improved the students' abilities to comprehend and complete the interactive inquiry-based learning assignment. This advantage may have even accrued to those students who did not actively contribute to online discussions, but were instead visited, and read messages in the online discussions. This particular student behaviour has been labelled as social "loafing" or more harshly judged by some as "lurking," but often the reason for it happening was because students had not managed their time well and had missed the "window" of opportunity for participating in online discussions—for example: "I seem to be a little late with my questions and most have already been asked!!" (by other students). Alternatively, students were reticent to post messages if they thought that they would be repeating what other students had already said and did not wish to be perceived as failing to contribute anything new to the online discussions—for example: "Hopefully not too repetitive." "I hope this is not repeating too much of what has already been said ..."

Two ways of examining students' engagement in monitoring their own understanding was to examine their disposition toward summarising and to examine the rationales they provided to explain choices or decisions they had made. The results using the first method indicate that more than 75% of students in both years were merely posting add-on notes in response to postings of previous student/s, and there was no summarising (see Table 2). However, when comparing 2002 with 2001, there was some improvement in

Table 1. Overall assessment of student postings in stage 1 of the inquiry-based learning situation for 2001–2002 (student numbers: $n_{2001} = 25$, $n_{2002} = 30$)

	2001 (No.)	2002 (No.)	(2001–2002) (%)
Messages	37	48	30
Threads	22	24	9
Branches	12	26	117
Instructor postings	3	4	33
Student repeat postings	9	14	56
Off-campus students in unit	63	65	3

student use of the online discussion facility, with a higher proportion of multiple references to other students' postings but still without convergence, and a decline in the proportion of stand-alone notes (see Table 2). In Hewitt's (2001) analysis of student use of threaded online discussions, virtually all messages could be characterised as add-on notes, with few people attempting to tie together ideas from different sources.

Hewitt (2001) points out that the "reply" convention of asynchronous computer-mediated communication software prompts students to respond to a single note without considering the overall discussion (thread). Often, it seems that students reply to a thread and leave the subject label (thread) intact, even though the content of the message may have drifted away from the original purpose. It is also likely that students do not read earlier messages to grasp how

Table 2. Assessment of the degree of convergence of student postings in stage 1 of the inquiry-based learning situation for 2001–2002 using Hewitt's (2001) analysis of thread type (student numbers: $n_{2001} = 25$, $n_{2002} = 30$)

Thread type ^a	2001			2002		
	Count	Postings per student	Percentage of total messages	Count	Postings per student	Percentage of total messages
Stand-alone	11	0.4	$n = 37$	10	0.3	21
Add-on	26	1.0	70	39	1.3	81
Multiple reference	10	0.4	27	25	0.8	52
Convergent	0	0.0	0	0	0.0	0

^aDefinition of thread type:

Stand-alone: notes that introduce new ideas to the conference and do not build on previous lines of inquiry. Typically, a stand-alone note is one that begins a new thread.

Add-on: a note that builds on the ideas of one other note in the conference. Typically, notes in which one person responds to an idea that someone else has introduced.

Multiple reference: notes that make a reference to two or more previous notes, but not in a way that would be considered an attempt at convergence.

Convergent: a note that discusses some of the ideas expressed in two or more other notes in the conference.

Table 3. Evaluation of the level of social presence, cognitive and system responses identified in student postings in stage 1 of the inquiry-based learning situation for 2001–2002 using Stacey (2002) and Rourke et al. (1999) content analysis schemes (student numbers: $n_{2001} = 25$, $n_{2002} = 30$)

Content analysis ^a	2001			2002		
	Postings per student		Percentage of total messages	Postings per student		Percentage of total messages
	Count	Mean	$n = 37$	Count	Mean	$n = 48$
Interactive responses	23	0.9	62	28	0.9	58
Affective responses	14	0.6	38	10	0.3	21
Cohesive responses	16	0.6	43	23	0.8	48
Social presence	53	0.7	48	71	0.7	42
Cognitive responses	35	1.4	95	47	1.6	98
System responses	4	0.2	11	2	0.1	4
Grand total	92			110		

^aDefinition of content analysis terms:

Interactive: includes complimenting, expressing appreciation or agreement, asking unsolicited questions, referring to others' messages, quoting from others' messages and continuing a thread.

Affective: includes expressing emotion, feeling or mood, use of humour and self-disclosure.

Cohesive: includes addressing or referring to other students by name, and/or the group as we, us, our, group, and salutations.

Cognitive: includes discussion and commentary on the unit content.

System: includes discussion related to the software or access issues.

the discussion has evolved. Examining the use of rationale allows one to establish the level of student mastery as well as whether the students are working collaboratively by explaining their position to others (Hewitt, 2001). A posting was considered to use rationale if there was any opinion or evidence offered (Orrill, 2002). After examining student postings, in stage 1 of the inquiry-based learning activity over both years, it was concluded that there was no evidence of student use of rationale, and student rationale was supplied only after instructor prompting.

Table 3 examines the relative amount of social presence over two consecutive years (at the same period in the teaching of the unit) and it appears that social presence is quite high, with over 50% of student postings being categorised as containing some form of social presence. However, the majority of messages (mean 96.5%) were coded as cognitive (related to content of the unit), while around 60% of the messages had some form of interactive response, and less than half had the presence of affective or cohesive responses. In 2001, there was a slightly higher proportion of affective responses as students were combining two tasks, one to introduce themselves and the other to formulate questions for stage 1 of the inquiry-based learning situation. In 2002, most of the affective responses were coded as "self-disclosure," where students were lamenting their lack of prior knowledge on the topic:

I don't know much about farming and land degradation ... but here goes nothing.

I also have limited knowledge and no experience in the area of land degradation.

Another type of affective response was the use of emoticons such as "Cya Ruth: -)"

As far as interactive responses were concerned, many were coded as students agreeing with each other or apologising for not contributing to the online discussions earlier or for sounding too repetitive. The proportion of students' responses classified as interactive were similar in both years (see Table 3). Other examples of interactive responses were students complimenting each other or praising the learning experience:

... really impressed with the questions raised. It really is a good means for cross pollination of ideas and knowledge.

It's great to read everyone's questions.

A lot of good points have been made. I'll try and add a couple.

Connie, Just read your comments and format. It was by far the most clear, legible and comprehensive. For what its worth, well done.

In Stacey's (2002) study, the proportion of affective, interactive and cohesive response units sustained over 3 weeks by students in a task-based small group discussion were on average 27%, 45% and 28%, respectively, of the social presence factors. These figures are comparable with, even though slightly lower than, those presented in this paper, but were sustained over a similar time period (2 weeks) (see Table 3). Hara, Bonk, and Angeli (2000) found that 27% of units (in this case paragraphs) consisted of some form of social cues. These were categorised as self-introduction, expression of feeling, greeting, closure, jokes, the use of symbolic icons and compliments to others. Examining the content of the students' postings in this study for social presence, it was found that evidence of social presence was restricted mostly to opening and closing remarks and was rarely recorded throughout the body of the student posting (as shown in the example in the section above headed Research Approach). However, the volume of social presence in this study has yet to be calculated and will require quantifying the frequency of coded units per posting, not merely establishing the presence per posting. Where social presence has been examined quantitatively, as Rourke et al. (1999) have done, with a social presence density figure that yields a unit of incidents per 1,000 words, the figures can be quite small. In their study, Rourke et al. recorded 33 incidents per 1,000 words. This is because social presence may consist of cohesive responses (e.g., salutations) that if used would be expected to appear only once or twice in a student posting.

Summary of Findings

The main findings on the evaluation of the level of social presence and degree of convergence in student threaded discussions of a learning situation were that student accessibility was limited, and student participation was unequal and of varying quality. To improve the quality and quantity of student participation in online discussions there needs to be greater instructor immediacy and explicit linking of online discussions to student outcomes or learning objectives. These improvements can be achieved largely by a repositioning of the face-to-face component of the online unit to allow for more appropriate timing of scaffolding and instruction on the operation of inquiry-based learning and use of online discussions.

Instructing students on how to approach inquiry-based learning, when studying off-campus, was more demanding than first anticipated, especially when participation by off-campus students using asynchronous computer-mediated communication was inconsistent, with unequal participation and of varying quality. Even though the value of asynchronous computer-mediated communication is perceived as allowing students access to learning materials and experiences when it suits them, the reality is that access, for the most part, is likely to be restricted and confined to discrete “windows of time” either at work or at home. For example, the students undertaking the unit had Internet access which, for the most part, was limited to at home after work (30%), or, if at work, restricted (14%), or in some cases unrestricted (17%). As one student commented: “Well I’m on work time now so I’ll get back to it (my boss is frowning).” Also, it appears that participation in the online discussions favoured women, especially in 2001, when 56% of female students contributed to the discussion even though they comprised 40% of the student enrolment. Again in 2002, female students’ involvement in the online discussions exceeded their representation (by 8%), but, in contrast to 2001, their male counterparts were overall more involved in online discussions (56% for male students compared to 46% for female students).

A number of suggestions have been made by Hewitt (2001) for improving the use of asynchronous computer-mediated communication as a means of facilitating student inquiry and problem solving, and potentially improving the level of convergence in online discussions. His suggestions include: appointing a moderator to summarise the discussion (preferably a student so other students could develop a deeper understanding of the problem-solving processes and the ways in which ideas may interrelate); assigning tasks that require group synthesis; using a linear discussion format;³ and, finally, augmenting asynchronous computer-mediated communication with synchronous technologies (such as video conferencing) to make group coordination and negotiating group consensus easier. McLean (1999) also suggested separating the substantive content from “meta-communication” of the knowledge-building process to avoid cluttering the work space with messages about due dates and deliverables rather than concentrating on the problems and issues under discussion. From

the perspective of the study reported here, the use of asynchronous computer-mediated communication and degree of convergence could be improved by integrating student participation with assessment and learning outcomes, such as designing tasks that require students to demonstrate synthesis and summarising skills. However, the mechanisms by which student interaction and postings in the online discussions will be assessed needs to be carefully crafted to avoid an unwieldy, non-authentic and cumbersome assessment process.

To improve teacher immediacy, level of social presence, and student support in inquiry-based learning the residential component of the online unit will be repositioned to before the beginning of the semester, hence allowing greater guidance and practice for students unfamiliar with inquiry-based learning, online instruction, as well as the purpose and outcomes of participation in online discussions. Initiating “how to” proceed in online discussions with students at the beginning of the unit will allow them to meet face to face, breaking down some of the reticence and awkwardness in participating in online discussions or online, before placing them into smaller workgroups in which they will continue to work throughout the semester, with designated and rotating roles (such as “starter,” “moderator” and “wrapper”).

Stacey (2002) emphasises the role of the instructor in modelling social presence factors and monitoring and moderating conference interaction to foster a secure and collaborative learning environment that facilitates and builds social presence. The experiences of this study would concur with these findings and suggest further that the future success of combining online communication facilities with inquiry-based learning activities is ensured only by enthusiastic and committed instructors who are prepared to monitor their teaching and to share their successes and failures (learning experiences) with candour and openness.

Notes on Contributor

Lisa Lobry de Bruyn is a senior lecturer, and has been involved in teaching many areas of natural resources at tertiary level since 1993 at the University of New England, Australia. Her innovative teaching methods have been recognised by, and showcased in, four Australian University Teaching Committee grants over the last 5 years.

Notes

1. The essence of inquiry-based learning is characterised by the adage “involve me and I understand.” It is student centred, actively engaging the students in constructing new knowledge, and reflecting upon their understandings, as well as developing skills and attitudes that inform the learning process and outcomes.
2. As the ability of learners to project themselves socially and effectively in a community of inquiry (Rourke et al., 1999).
3. Linear discussion format does not allow branching and all notes are simply stored in

a single, chronological order. WebCT Discussions™ allows for threaded or unthreaded display of notes, with the latter being a linear discussion format.

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Appendix: Structured learning guide

Modified from Björck (2002), who originally adapted it from Barrows and Tamblyn (1980).
Step

1. Meet the situation (scenario).
2. Re-define the question/s at the end of the situation statement.
3. Gather the facts:
 - Identify relevant information from the situation statement
 - Identify what you need to know (further information and learning)
 - Identify potential information/learning resources (place ideas in step 5)
4. Generate relevant questions from the previous section:
 - For student to go away and answer before next week
 - For instructor to go away and answer in the next week
5. Research required (type of ...)
6. Rephrase the question/s (from step 2) which define/s the scope and the nature of the question/s and boundaries or breadth of your response (half a page limit).
7. This is where you identify and justify the answer to the question/s posed at the end of the situation statement. The process may require you to generate a range of likely answers, and justify with supporting evidence the most probable response (this is the major component of your answer).
8. Advocate the most realistic answer (select the “best” answer and justify it) (overall conclusion/summary, one page maximum).

Steps 6, 7 and 8 need to be written up and presented in your answer.

Steps 3 to 4 are to be carried out by you in the Online Discussions.

