Students' perceptions of collaborative practices in early years' learning: Why we may need to rethink current asynchronous approaches

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Abstract

This paper explores the use of discussion boards as a collaborative practice in architecture studios or other architecture classes as a means to empower communication between students and between students and teacher(s). For four years a beginning design class in an architecture school used discussion boards both as a means of communication and to submit assessable work. An evaluation of students' perceptions of the usefulness of discussion boards to their learning revealed that there was a decline from 75% to 56% in the number of students who agreed to strongly agreed that "Discussion boards were useful to my learning" during that 4-year period which is a very significant drop ($p = 0.0001$) in student's perceptions of their usefulness (Shannon, 2004). Students' reasons explored through qualitative research methods to reveal that students commencing University are seeking social learning experiences that connect them with their fellow learners. Whilst we would hope that discussion boards are one means for this connectivity to happen, the analysis reveals that discussion board submissions and responses seldom acknowledge and build on prior arguments (that is, they are not collaborative). Thus, true collaboration and communication suffers. Proposals to improve the usefulness of discussion boards are discussed.

Keywords

architectural education, collaboration, evaluation, discussion boards

Introduction

Whilst asynchronous online communication promises so much in terms of increasing interactivity between students, and students and staff (Jonassen, 2000) there is evidence from a longitudinal case study (2001–2004) amongst first year design studies students that online environments have failed to create a collaborative learning space for students. This paper attempts to unpack more generally why students may have lost interest in asynchronous communication and discusses best practice in the use of asynchronous online communication to engage students in collaborative learning.

Evaluation results summarised

Students in a first year design studies course at the University of Adelaide evaluated the contribution to their learning of online technologies over the period 2001-2004 through their Student Evaluation of Learning and Teaching responses. A minimum 80% believe that (1) online learning has enhanced their ability to complete tasks; at least 60% believe that (2) online learning has helped their ability to learn independently; and 67% believe that (3) their knowledge of the course was enhanced through the online course experiences. But there has been a very significant decline from 2002 to 2004 in the numbers who believe (1) and (2). There has also been a 20% decrease from 2001 to 2004 in the number who believe that (4) the use of discussion boards (assessable and non-assessable) was useful to their learning, and this decline is very significant ($p=0.0001$) (Shannon, 2004).

Literature

There are many case studies of architecture students collaborating online reported in the literature (Hart, 2005). However, few papers look particularly into *student evaluation* of collaborative online environments, as Murphy and Loveless do in graduate level education (2005). Amongst those that do are Andia (2002), O'Brien, Soibelman and Elvin (2003); Lambert (2003); Madrazo and Vidal (2002) and Laiserin (2002). This is the gap this paper seeks to fill with a bounded longitudinal case study of students' evaluations of online asynchronous collaboration.

Method

The author, who holds a long-term interest in "how learning happens", conducted a longitudinal study that sought students' perceptions of the impact of online learning environments on their learning and collaboration. Structured feedback was elicited at the end of each course 2001–2004 through evaluation questions included in standard paper based Student Evaluation of Learning and Teaching (SELT) questionnaires. The questions, informed by the international literature, sought feedback on key learning attributes highly valued in online learning environments (Graham et al., 2001). They were (1) completing tasks; (2) independent learning; (3) knowledge acquisition; and (4) increasing interactivity. The results of the Likert-scaled questions were analysed and reported by the Evaluation Program of the Learning and Teaching Development Unit (LTDU) at the University of Adelaide as 'Means' and 'Standard Deviations'. A standard questionnaire surveying students' prior knowledge of computers and the online environment was also conducted by the School's Academic Registrar from 2001–2004 at enrolment for all first year students. The purpose of this questionnaire was to gauge students' starting point computer skills and online access to develop appropriate in-School support. The results were analysed using Excel and were reported to all staff.

The course

The introductory Built Environments course evaluated is a Semester1, Level 1, compulsory course in a professional degree program. The course contains no explicit aim to acquire generic computer skills — this is subsumed to the emphasis upon the development of communication skills and the relationship between them. The overarching graduate attributes for the program are the gaining of current professional skills, and principally the ability to think critically and respond creatively. Familiarity with industry level computer skills is thus considered essential.

There are three assignments in the course designed to assess skills, values and knowledge. First, an iterative discussion board assignment "e-research" takes place over 4 weeks. Students form into groups of 5–6 around current topics in the built environment — 25 annually renewed topics for which new online resources are provided (Shannon, 2004a). Students work as individuals, but as part of a topic group. Students commence with a session in Week 1 on using discussion boards, after which all their interaction with peers, group members, tutor, and coordinator takes place through the discussion board. There are four assessed discussion board entries — Week 1, 2%, Week 2, 3%, Week 3, 5% and Week 4, 12%, designed to scaffold learning through iterative assessable hand-ins. In Weeks 3 and 4, students must respond to their peers, and in Week 4, summarise all the arguments and research of their topic group. In 2004 the assessable discussion board had 574 staff and student postings for a class of 112 students whereas in 2001 there were 682 for a smaller class of 88 students.

The second topic "e-role play", concerning divisive issues in the local built environment, invites tutorial groups to form five groups around five topics, and then asks each individual to select a stakeholder role within that topic. The assessment is an integrated illustrated *PowerPoint* presentation that highlights each stakeholder's role, values and understandings (Shannon 2004b). Accompanying this 4-week assignment is a non-assessed discussion board for groups to use to share information, and build up their knowledge of their peers' points of view. In 2004, the non-assessable discussion board had 143 student entries (from 112 students) whereas in 2001 there were 140 entries from 88 students showing the falling off of interest from 2001 in its use from students.

Results

Table 1 reports the results from the SELT question designed to interrogate students' perceptions of the impact of the online course on increasing interactivity. This attribute, selected from the four attributes on which data was gathered has been identified as a key learning attribute, and is valued as a unique quality for online learning environments (Graham et al.). Students were asked to evaluate the proposition that "The discussion boards were useful to my learning " on a Likert Scale from 1–7 where 1 = strongly disagree and 7 = strongly agree. The discussion boards were introduced to increase interactivity (see 'The Course')

Table 1: Student evaluations of online learning and teaching 2001–2004

Question	2001 R=73; N=88 83 % response Mean, Median, Std Deviation [N of + responses Likert 5–7] % of +ve responses	2002 R=71; N=103 69 % response Mean, Median, Std Deviation [N of + responses Likert 5–7] % of +ve responses	2003 R=65; N=109 60 % response Mean, Median, Std Deviation [N of + responses Likert 5–7] % of +ve responses	2004 R=77; N=107 72 % response Mean, Median, Std Deviation [N of + responses Likert 5–7] % of +ve responses
The discussion boards were useful to my learning	5.3, 5, 1.2 [55] 75.3%	4.9, 5, 1.3 [44] 62%	4.6, 5, 1.3 [39] 57.4%	4.5, 5, 1.6 [44] 55.6%

The results are statistically significant for the question: "The Discussion boards were useful to my learning", where there is a significant drop from 2001 to 2002 ($p = 0.0283$). There is no significant drop from 2002 to 2003, nor is there one from 2003 to 2004. Comparing 2001 and 2004, there is a very significant drop ($p = 0.0001$). Understanding more about the changes in the students' computer and Internet familiarity during this time frame 2001–2004 may help to explain the changes in their opinions. During the period 2001–2004 more students have become familiar with the web, and have more access to it: the novelty value has diminished, and their ubiquitous use of the web as browsers and communicators through email means it is an everyday happening for them, and not special to coursework where it may be seen as a "drag" or equivalent to, and no more novel than any other university assignment. Table 2 provides the students' entry-level data.

Table 2: Survey of new students' prior computer skills and online access 2001–2004

Question	2001 R=94 YES Response Results as %	2002 R=109 YES Response Results as %	2003 R=106 YES Response Results as %	2004 R=68 YES Response Results as %
Are you familiar with using a personal computer (PC)	91	99	98	100
Have you used electronic mail	84	94	97	100
Are you familiar with the World Wide Web as a user "browsing"	91	97	99	99
Are you familiar with the World Wide Web as a web site creator	17	17	19	22
Do you have a home-based internet connection at your term-time address?	69	66	82	88

Table 3 provides other performance indicators for the course: class size, the Tertiary Entrance Ranking (TER) score of those enrolling, the percentage of school leavers, the withdrawal rate and the average assessment attained (the marks are obtained from double blind marking). The classes are markedly larger, the TER score has risen, but the class average mark has fallen.

Table 3: Other performance indicators for the course surveyed

Performance Indicator	2001	2002	2003	2004
Class size	88	106	117	112
TER score	68.1	71.25	73.8	77.7
% School leavers	71.6	88	78.9	n/a
% Withdrawal rate	3	3	6	6
% Average mark	69.6	67.9	64.5	64.5

Table 4 reveals that students and staff are not making relatively the same number of entries to non-assessable discussion boards as they are to assessable discussion boards. Tutorial groups were randomly selected for analysis of postings.

Table 4: Number of entries per student discussion boards 2001–2004

Year	Assessable discussion board postings/student enrolled in course	Non-assessable discussion board postings/student enrolled in course
2001 (4 tutorial groups)	682/88 = 7.75	140/88 = 1.59
2002 (5 tutorial groups)	856/106 = 8.08	99/106 = 0.93
2003 (6 tutorial groups)	827/117 = 7.07	148/117 =1.26
2004 (5 tutorial groups)	574/112 = 5.13	183/112 = 1.63

The Table 4 results are significant. There is a significant difference on the assessable discussion board side of the table. The number of assessable discussion boards used in 2001 is greater than 2004 (p=0.002); in 2002 it is greater than in 2004 (p=0.000) and 2003 it is greater than 2004 (p=0.009). There is no significant difference on the non-assessable discussion board postings (sample size too small).

Table 5: Quality of collaboration in entries displayed in assessable discussion boards

Year	Assessable discussion boards			Non-assessable discussion boards		
	No. of Student Entries	Collaborative entries	Non-collaborative	No. of Student Entries	Collaborative	Non-collaborative
2001 Tute 3	107	44 (41%)	66 (59%)	7*	2 (29%)*	5 (71%)*
2001 Tute 4	102	42 (41%)	60 (59%)	37	34 (92%)	3 (8%)
2004 Tute D	112	48 (43%)	64 (57%)	14	8 (57%)	6 (43%)
2004 Tute E	81	21 (26%)	60 (74%)	63	54 (86%)	9 (14%)

*The findings from 2001 Tute 3 to be disregarded as the number of postings is too small to create valid differences.

When the quality of collaboration in discussion boards is examined (see Table 5), by considering and categorising every individual posting as collaborative (seeking help from peers or teachers, acknowledging and building on arguments, agreeing and disagreeing with peers, seeking or proffering files, urls, references, leads and ideas) or non-collaborative (informational, goal oriented, showing what they know) it can be seen that despite a much larger number of postings per student for assessable discussion boards, most postings were not collaborative.

Three of four sets of postings examined from the non-assessable discussion boards revealed a majority of collaborative postings. This finding supports their discretionary nature — where there is no point in displaying knowledge for the teacher. These results are not significant.

Table 6: Quality of collaboration in entries posted by women

Year Tutorials	No. and % of women in tutorial	No. and % of entries posted by women in assessable discussion boards	Assessable discussion boards	No. and % of entries posted by women in non-assessable discussion boards	Non-assessable discussion boards
			# of collaborative entries by women/total collaborative entries		# of collaborative entries by women/total collaborative entries
2001 Tute 3	9 F = 36%	41F = 38%	17F/44 (39%)	3F = 43%**	1F/2** (50%)
2001 Tute 4	5F = 23%	29F = 28%	13F/42 (31%)	8F = 22%	7F/34 (21%)
2004 Tute D	13F = 62%	75F = 67%	26F/48 (54%)	12F = 86%	7F/8 (88%)
2004 Tute E	9F = 39%	35F = 43%	11F/21 (52%)	31F = 49%	27F/54 (50%)

**The findings from 2001 Tute 3 'Non-assessable discussion boards' to be disregarded as the number of postings is too small to create valid differences.

There was over-representation of entries by female students in the assessable discussion boards in 2001 and 2004 (but these results are not significant), which may indicate that the female students desired this form of communication, that they enjoyed it and that they therefore contributed to it more than their male classmates. Compared with their numbers in the tutorials, their entries were generally more likely to be collaborative than men's entries in assessable discussion boards. That was also generally the case for non-assessable discussion boards. Whilst interesting, neither of these results is significant.

Discussion and conclusion

Whilst Australia-wide students in 2004 (Krause et al., 2005) are more certain about many aspects of their University education than they were in 2001(McInnis, James, & Hartley, 2000) it revealed starling data related to preparation for learning and seeking support from staff and peers. The 2005 *The first year experience in Australian universities* study reveals that 36% said they did not ever seek advice and assistance from staff; and 20% report that they never work with other students. Students in architecture reported more "work on projects with peers" in and out of the classroom than any other student group (Krause et al., p. 41) where overall only 40% of students report daily/weekly peer collaboration. Overall, only 16% of students report daily or weekly use of discussion boards, whilst 25% use them irregularly and 58% never use them, although 46% believe online discussion groups with other students to be useful. However, architecture students surveyed reported only a 10% daily or weekly use of discussion boards, which reversed a pattern of being the heaviest discussion board users of all discipline groups in 1999 (Krause et al., p. 45). Krause et al. report that first year students receive more opportunities for learning through the use of ICT (Information Communication Technologies) than they had expected, and crucial to their current evaluation is the finding that whilst 45% would like more online resources, 23% say that they have no need of them. The bounded longitudinal study underlines that some students choose not to engage with the available technology and the level of engagement has significantly declined from 2001.

These study results are unwelcome to any teacher who has invested heavily in creating what is purported to be a collaborative learning environment. What are the alternatives? Scholars are investigating new generation asynchronous and synchronous alternatives for students' connections with other students and staff members. Videoconferencing (Newbury & McKenzie, 2004), Smart Boards (Shannon, 2003), Wikis (Auger, Raitman, & Zhou, 2004) and SMS (Horstmanshof, 2004) are all technologies with potential for connecting students. Best practice use of discussion boards may also enhance the collaborative qualities that were so crucial to their development and integration into courses such as the one reported here. Recommendations for the use of discussion boards (DBs) to encourage collaboration include:

i. Threading DBs with questions that encourage debate *amongst the group* as opposed to narrative or simply answering questions for the teacher.

ii. Running DBs over several weeks — they become more collaborative iteratively throughout assignments as students share views.

iii. Information sharing by enhancing the ways in which DBs can facilitate file sharing.

iv. Activity in the DB by coordinator or tutor — students are looking for feedback and clarification in assessable DBs from tutors as well as peers.

v. Self-selected DB groups around topics ensure students are interested in the topic.

vi. Rewarding through the marking regime active referral to group members' perspectives.

Persisting with creating an effective collaborative learning environment is a continuing challenge for all charged with the coordination of large first year classes. Wikis are being trialled in the School in Semester 2, 2005, and the early results reveal a high level of uptake and collaborative engagement.

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> I feel that the discussion board has been a very effective medium for all of us campus "criticizers" to bounce around our ideas. I'm glad to have had the opportunity to read other opinions. I've also been flattered by others who have had common ideas to mine and chosen to quote me!
>
> Student DL, 2004

> Despite having enjoyed myself with this task immensely, I definitely regret not having raised this issue sooner [quality of design], with the hope of engaging some members of our group in debate. Thankyou all, though, for your interesting opinions regarding other aspects of this engaging issue.
>
> Student SY, 2004

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