

Choosing the best from blended and online e-learning

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Abstract

Blended learning should incorporate the best of contact and online learning, allowing flexibility while retaining connectedness. Therefore, designing effective instruction requires research-informed choices. The Community of Inquiry (Col) survey is a well-validated instrument measuring social-, teaching- and cognitive presences in e-learning that reflect the quality of e-learning courses (Garrison, Anderson and Archer 2000). We compared the Col results of two blended postgraduate courses: one predominantly online and the other mostly in contact mode, taught by the same lecturer. The end-of-course deliverable for both courses in research methodology was a research proposal. Both courses utilised the learning management system (LMS), while students with insufficient Internet access communicated via email or telephone. Both courses included the two-tiered double-blind electronic peer review of assignments. One group had weekly contact sessions, and the other only an initial welcoming session. We discuss using peer review for formative feedback as a particularly beneficial strategy to facilitate teaching effectively in such large classes, and the limitations thereof. The Col survey showed the strengths of the online environment, with very strong teaching presences due to good organisation, comprehensive online supportive documentation, and automated feedback. High cognitive presence was due to peer review; strong constructive alignment between objectives, activities and assessment; and in the online class due to the constructivist teaching practice of fostering student ownership of outcomes. In both classes social presence was the weakest, although the contact class scored significantly higher on this presence. Low social presence did not compromise course completion in any group.

INTRODUCTION

Distance learning is often inevitable, due to the distributed location and work circumstances of students. Paper-based distance education does not offer the best

solution, as graduation rates compare poorly and are about half that of contact education (University of Pretoria 2006, 95). Distributed students experience many constraints that emanate from feelings of disconnectedness (Rovai and Wighting 2005), causing them to lose heart and abandon their studies. There is a strong need locally to incorporate e-learning to replace paper-based distance education for students who have access to the Internet. The quality of e-learning would be as dubious as paper-based education, if courses consisted of passive content with no individual support or interaction with lecturers or peers (Holmberg 1989). The pedagogy for successful e-learning differs greatly from that encountered in traditional classroom education, in order to harness the power of the medium (Coppola, Hiltz and Rotter 2002; Pelz 2004).

A recent large-scale meta-analysis published by the United States Department of Education (Means, Toyama, Murphy, Bakia and Jones 2009) shows that students receiving blended learning perform better than students receiving either classroom- or online-only tuition. Blended delivery courses can be flexible, consisting of differing proportions of contact time to online time to accommodate the subject requirements and student preferences, if designed purposefully (Vaughan 2010). Research has shown that a blended delivery mode can retain the best of contact and electronic learning worlds, giving distance students the required flexibility, while retaining the connectedness characteristics of a classroom.

While the University of Pretoria is officially a contact institution that endorses blended learning, some courses for distributed students contain such a small contact tuition component, that the delivery closely resembles fully online e-learning. Such courses require attention to the concomitant quality assurance and pedagogy that characterise e-learning.

The key to successful web technology-enhanced distance learning is to foster students' connectedness and provide an opportunity for them to become part of a community that supports them in their quest for new knowledge.

LITERATURE

Blended learning

The United States (US) has seen phenomenal growth in the number of online higher education courses, while the number of blended or hybrid courses has remained relatively constant (Allen, Seaman and Garrett 2007). There is evidence that blended delivery is not a developmental transition stage between classroom delivery and fully online course delivery, but a specialised delivery mode with

its own merits. Though some rate fully online courses as a superior delivery mode (Allen et al. 2007), it is still beyond the reach of a significant portion of higher education students in southern Africa, due to limited Internet availability (Roycroft and Anantho 2003).

While Garrison and Kanuka (2004) posit that little learning takes place in the lecture mode of teaching, there are many ways of delivering e-learning. On the one end of the scale e-learning enhances contact teaching, as an enhanced delivery course can consist of mainly contact lectures supported with web-based learning material and administrative information (Lotriet, Jorissen and Nagel 2008). When courses include online discussions, assessment and assignments, the proportion of web-based activities increases up to a point where classroom activities become optional, and at the extreme, e-learning is fully online (see Figure 1).

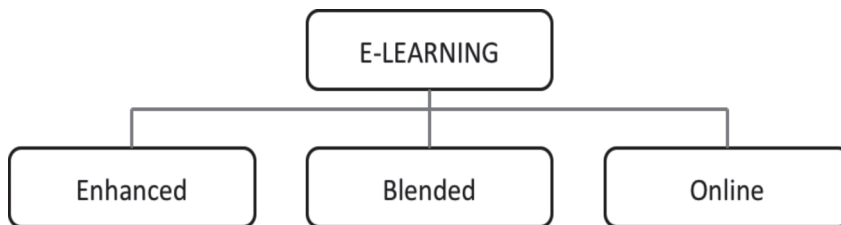


Figure 1: A continuum of e-learning (Garrison 2004)

According to Garrison and Kanuka (2004, 95) ‘blended learning is the thoughtful integration of classroom face-to-face learning experiences with online learning experiences’. At the University of Pretoria (UP), Lotriet and colleagues use the term ‘blended learning’ as synonym for multi-modal delivery, and they do not restrict the term to denote a blend of face-to-face lectures and learning management system (LMS)-delivered content and activities. Because many UP students do not have sufficient Internet access, this model encourages lecturers to use other technologies and delivery modes, like CD ROM, SMS technology, situated site visits, third-party software, narrated PowerPoint presentations, podcasts and email in innovative ways to engage students outside the classroom. Pretoria University therefore encourages the development of unique and innovative blends of delivery modes for each class (Lotriet et al. 2008), adhering to the concept that blended learning should integrate ‘the strengths of synchronous (face-to-face) and asynchronous (text-based Internet) learning activities’ (Garrison and Kanuka 2004, 95). The decision of which activities to deliver in each mode should reflect the situation analysis; particularly suiting access to the Internet in the particular group of students (Lotriet et al. 2008). Lecturers have to make informed decisions

regarding the teaching of certain skills, particularly as ‘writing can be a highly effective form of communication that encourages reflection and precision of expression. When thoughtfully integrated with the rich dynamic of fast-paced, spontaneous verbal communication in a face-to-face learning environment, the educational possibilities are multiplied’ (Garrison and Kanuka 2004, 95). The problem is how to gauge the value of each innovative practice, and how to evaluate the contribution of new technologies and approaches towards student success (Ice and Nagel 2010). The biggest challenge in e-learning is to foster the engagement of students (Vaughan 2010).

For many local teaching situations, moderated online discussions that characterise e-learning are not feasible tools to mediate online interaction, particularly in very large classes with too few facilitators, or with distributed students who do not have sufficient Internet access (Swan et al. 2010). Lecturers of such classes have to implement other tactics to engage students, such as peer review.

Peer review

Structured peer review is a useful way of engaging students at a high cognitive level. At the same time it reduces the instructor’s dominance or sage-on-the-stage role, in favour of a more student-centred guide-on-the-side facilitating role (Arbaugh 2010; Mazzolini and Maddison 2003). While it is necessary to provide ways for adult learners to share valuable experiences and insights (Rossman 1999), peers can provide more extensive comments than facilitators or assistants had time for (Gehring 2001), and students benefit from peer feedback (Boud, Cohen and Sampson 1999). Management of peer review documents using other document distributing systems in conjunction with the LMS has been a bone of contention, and has limited its widespread implementation. Gehring (2001) initially solved the problem by successfully using email in addition to the web-based LMS to track and distribute documents. ‘The other problem was maintaining a uniform standard of review. Two things solved the issues: using comprehensive rubrics for students to use as checklists. Further, we used a two-tiered approach, as the original author could evaluate the comprehensiveness of his reviewers’ comments.’ He also implemented a system of ‘Review of review: students assess the reviews for being careful and helpful to contribute a grade of 25 per cent of total. This ensures careful and thoughtful reviews’ (Gehring 2001). Conducting formative assessment contributes to the sustained evaluation of students’ own work – a practice that will equip them for the rest of their postgraduate studies, leading to life-long learning (Boud 2000).

THE COMMUNITY OF INQUIRY

Over the past decade, the Community of Inquiry (CoI) framework has been refined as a process model for designing online instruction, based on a social constructivist pedagogy (Arbaugh 2010). The CoI survey is a well-validated instrument used to gauge the quality of e-learning courses (Diaz, Swan, Ice and Kupczynski 2010), and it has been successful in measuring the quality of both fully online and blended courses (Vaughan 2010). The CoI framework proposes that successful learning takes place when there are three presences in a class, namely social-, teaching- and cognitive (Garrison, Anderson and Archer 2000). Figure 2 shows how these presences all contribute to students' learning experience, while they overlap to some extent, thus supporting each other.

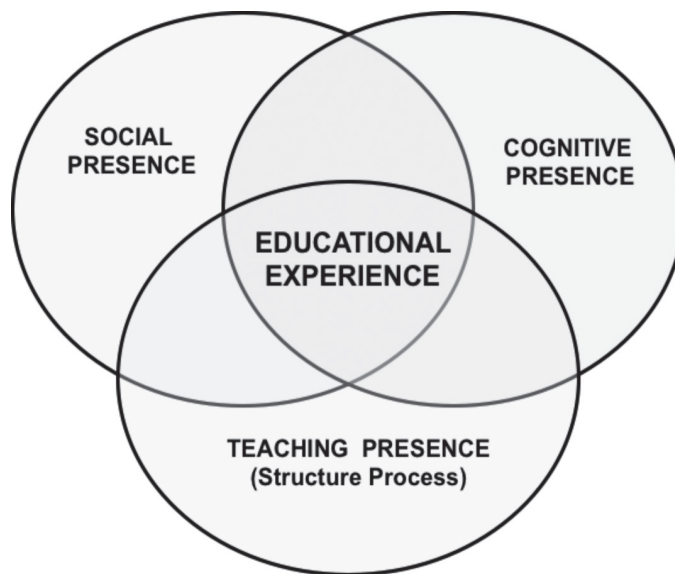


Figure 2: The Community of Inquiry framework (Garrison 2000)

Teaching presence

The three elements of teaching presence are:

- Design and organisation (setting curriculum, activities, assessment) and presenting the course;
- Facilitation (shaping constructive discourse, all participants share in this function);
- Direct instruction (focusing on and resolving issues).

A lecturer contributes to the teaching presence by doing instructional design and organisation prior to the course, and offering online facilitation and direct instruction during the course (Arbaugh 2010). 'Teaching presence is a means to an end to support and enhance social and cognitive presence for the purpose of realizing educational outcomes' (Garrison et al. 2000, 90). Therefore, teaching presence does not stand alone. When students purposefully construct knowledge which results in deep learning, it also signifies a high level of cognitive presence.

Social presence

Social presence is defined as the ability of participants in the Community of Inquiry to project their personal characteristics into the community, thereby presenting themselves to the other participants as 'real people'. The primary importance of this element is its function as a support for cognitive presence, indirectly facilitating the process of critical thinking carried on by the community of learners. (Garrison et al. 2000, 89)

Social presence indicates that students feel they belong to a community where they can express themselves freely. It consists of the following elements:

- Affective expression (expressing emotion, self-projection);
- Open communication (learning climate, risk-free expression);
- Group cohesion (group identity, collaboration).

The value of social presence lies in students' satisfaction with their course and in ameliorating the feelings of loneliness and disconnectedness that cause them to lose heart and abandon their studies (Richardson and Swan 2003). Research also showed that 'by increasing social presence through the use of collaborative software, it is possible to lessen the negative impact of increasing group size' (Roberts and Lowry 2006, 28) – an aspect that has implications for the growing size of online classes in the present context. Both teaching and social presence have a causal effect on cognitive presence (Garrison, Cleveland-Innes and Fung 2010).

Cognitive presence

Cognitive presence relates to the development of higher-order thinking skills (Shea et al. 2010). The CoI framework identifies four phases under the cognitive presence, which correspond to the Practical Inquiry model (Garrison et al. 2000). The first event in the development of cognitive presence is a triggering event, which can be the presentation of a question or problem that needs resolution (see Figure 3). The second stage is an exploratory phase, where people seek more

information to clarify the stated problem. When information and ideas start to amalgamate it heralds the third stage, namely integration, during which plausible explanations are formulated. In the fourth stage, ideas are tested and applied directly to the problem at hand, leading to resolution. Sustained reflection and discourse enable students to develop cognitive presence.



Figure 3: The Practical Inquiry model (Garrison 2000)

The research questions asked in this study are: Can a course taught with minimal contact sessions to a very large class offer acceptable learning and teaching quality, leading to successful outcomes? The second question is: Is the CoI a suitable instrument to examine the quality of blended and online courses in the context that this university presents them?

CONTEXT OF THE STUDY

The courses, students and lecturer

Economics and Management Sciences is one of the largest faculties at this university. Currently, 2 361 postgraduate students are enrolled in this faculty. While some professional qualifications like Accounting follow industry-prescribed curricula and standards, and their students generally continue with postgraduate studies directly after completing their first degree, students in many other academic departments work for some time before returning to university

for part-time postgraduate studies. Many postgraduate students received their degrees from other institutions. The immense responsibility to equip vast numbers of students with divergent academic backgrounds and research skills with the ability to conduct high-quality research rests on their study supervisors. In 2007, one department conceptualised a generic Research Methodology course without academic credit as the initial part of Master's and PhD studies in this faculty. In this course, groups of students mastered the requirements for conducting independent research in a structured way. As deliverable at the end of the course, students produced research proposals that would frame the rest of their postgraduate research and studies. During the methodology course students identified their own research topics, and initiated an academic discourse with their allocated study supervisors. This course, which had no classroom component, also accommodated distributed students from elsewhere in Africa.

Over the past three years student numbers have been growing steadily. In 2008, 86 students in EBW801 (Master's and PhD) completed the course, and in 2009, 162 students. Due to the sheer size of this last class, it was decided to split the 2010 enrolment into February and August intakes. The two cohorts drew on the same content on the LMS, but a new lecturer facilitated the second intake. From the 2010 first intake of 103, 101 students completed the course with an average grade of 66.5 per cent, of whom 26 students obtained distinctions. Only three students had to do additional work to finish the course. In this study, we investigate replies by the first 2010 group, compared to the 2009 class.

The lecturer of the 2008–2010 first semester classes also taught a similar Research Methodology curriculum during the first semester to a B.Com. Honours class. The 82 students in this course all completed this component of their studies successfully.

Course delivery was similar, as both degree courses utilised the LMS as a repository for learning and support material, online assessment, plagiarism prevention, administrative information, announcements and assignments. Both classes engaged in electronic peer review of peers' research proposals. The only real difference between the two classes was that the distributed Master's and PhD students had no contact lectures after an initial welcoming session, whereas the Honours students attended 13 weekly lectures of two-and-a-half hours each on campus. In the research we compared the results of the CoI surveys of the 2009 and 2010 distance cohorts (Master's and PhD). We also compared the two 2010 courses, where one was nearly fully online and delivered to distributed students, while the other was delivered in a blended mode, with a strong face-to-face component.

All electronic course activities for the distributed students performed double duty (Boud 2000); they kept students actively engaged and on-task, while automating most of the lecturer's facilitation and feedback functions. The LMS hosted most of the course activities, as described below.

Communication, facilitation and feedback

At the outset of the course, the distributed Master's and PhD students (course code EBW) met on campus one Saturday for a single morning's orientation and information session. Attendance was not compulsory, but the computer session that included logging in to the LMS and conducting an electronic information search involving the library's e-resources, was beneficial to those requiring hands-on assistance. This welcoming session had tremendous inspirational value, according to the students.

Inadequate Internet connectivity and bandwidth in parts of Africa restricted access to the LMS for some of the distributed students, necessitating the communication of important information via email. African students were also unable to upload their bulky examination projects via the bandwidth-intensive LMS, and opted to use email instead. Connectivity was also the reason why students could not review peer documents online – a functionality afforded by other proprietary software programmes we investigated. Hence, email played an important role in the peer review process, as explained later. After personally replying to between 15 and 20 weekly student emails per course, the lecturer captured those issues and concatenated his replies in a weekly email digest, distributed via a listserv. This information was also incorporated into the design of the forthcoming year's class notes and templates. Every Monday he sent a general weekly email about the work allocation for the coming week. Although learning material and activities were delivered in the LMS, the Honours students did not communicate online with one another. The lecturer dealt adequately with questions and answers during the lecture slot on Monday nights, with further information and reminders supplied by email, including a summary of the coming week's preparations and work allocation.

Peer review. Both classes conducted double blind electronic peer review at two stages of their research proposals; participation in at least one round was compulsory. The lecturer also used a custom-built electronic programme to manage, track and distribute documents for peer review, the process of which was managed as follows:

- Authors submitted draft documents via Assignment tool in the LMS;
- Lecturer removed identifiable information and allocated a serial number to each document;

- Lecturer distributed each document to two reviewers via email;
- Reviewers evaluated the documents allocated to them using a rubric and the ‘track changes’ and ‘comments’ functions in MS Word;
- Reviewers submitted the evaluated documents via the Assignment tool in the LMS;
- Lecturer returned evaluated documents to authors via email;
- Authors perused the comments they received from their reviewers;
- Authors evaluated the comprehensiveness and value (usefulness) of reviews using an attached evaluation form and submitted the completed form via the LMS Assignment tool;
- Lecturer returned evaluation forms to reviewers via email (Nagel and Kotzé 2010, 47).

It was necessary to adhere strictly to deadlines preceding the distribution of documents for peer review; there was no room for individual postponement. Students did, however, have two opportunities to participate in peer review.

Groups and discussions: Students self-enrolled into speciality groups that corresponded to each academic department in the faculty. Although students had access to their own group discussion forums, they hardly used those. Peer reviewers were selected from students with a similar speciality, based on these groups.

Quizzes: Students in both courses had to complete a number of compulsory online assessments in the LMS. These assessments encouraged students to study certain fundamental sections of content on their own, and provided automated feedback on their progress. Minimum knowledge levels, as measured in the quizzes, provided criteria for the selective release of subsequent content to different students, thus adapting the pace to individual students’ progress.

Turnitin: Although students had online resources to help them use Refworks™, an open source online reference management programme, it was not enforced and many still made referencing mistakes. Furthermore, students had widely differing ESL writing skills, and some had inadequate knowledge of academic writing and source attribution. Students had to submit each assignment first to Turnitin™, an anti-plagiarism software programme that they accessed from a link in the LMS. The Turnitin™ similarity reports indicated all text that was similar to other online text sources, and calculated the percentage of similarity in order to exclude plagiarism. The lecturer encouraged students to peruse the similarity reports and improve their paraphrasing and referencing skills, before

submitting their final assignments in the LMS Assignment tool. In order to automate corrections of other writing faults and common mistakes, the lecturer provided an electronic document template.

Document checker: The lecturer developed an electronic template that functioned like a document checker. It automatically identified the writing, grammar, formatting and citation errors most commonly found in academic writing. It went beyond the language- and grammar-checking functions of the word processor. Students could use this template for writing different versions of their proposals, and to review their allocated peers' writings.

METHODOLOGY

In this study we used a design research protocol (Reeves 2005), where our complex and ill-defined problem was how to design effective postgraduate distance-learning courses using the electronic delivery modes at our disposal. This study builds upon and verifies the foundation study of the 2009 class (Nagel and Kotzé 2010). (At present, we have extended the study longitudinally to the same course in 2010, and have added a similar course delivered in a different mode.) At the conclusion of the courses, we provided the 34-item CoI survey instrument (Díaz et al. 2010) for voluntary completion in the LMS. We added items to capture biographical data as well as students' experience of the peer review process and document template. The CoI survey and questions concerning peer review used a five-point Likert-type scale, ranging from strongly disagree (1) to strongly agree (5), whereas students responded with 'true' or 'false' to questions about the document checker. Students could elaborate in open-ended questions on the value of peer review and of the document checker, and could make suggestions for improving the course. We used a mixed methodology to analyse quantitative and qualitative data (from open-ended questions and interviews with the lecturer) to crystallise (Tobin and Begley 2004) findings from different sources. In addition to standard descriptive statistics and the calculation of the CoI survey averages, the data from different cohorts were compared using the Kruskal-Wallis test (BMDP Statistical Software) to calculate the significance of the differences between classes.

FINDINGS AND DISCUSSION

Having access to CoI results from two consecutive identical courses, provided the authors with an opportunity to gauge the sensitivity and replicability of the instrument with the available numbers of students. Data from two consecutive

offerings of the same course to comparable students, and a concomitant delivery of the same course to a different group of students (albeit in a different delivery mode), all facilitated by the same lecturer, provided us with an opportunity for meaningful comparisons. We compared data from the different cohorts, in order to uncover whether the absence or presence of face-to-face classes influenced students' experience of the learning community. As we had ascertained the pivotal role peer review played in a previous study (see Nagel 2010), we wanted to confirm those findings in a longitudinal study and sought to explore whether it was generalisable to a different class.

The CoI survey

We compared the results of the 2009 and 2010 cohorts of distributed (EBW) students, and here discuss the findings in relation to the qualitative data. The response rates of these cohorts were 39.5 and 41.7 per cent respectively. We found nearly identical scores over the two years, suggesting that the same factors influenced the two cohorts of the same course, and that the sample was representative and adequate in size to capture the CoI presences in the class, as the instrument provided reliable data. The response rate for the Honours students was 47 per cent.

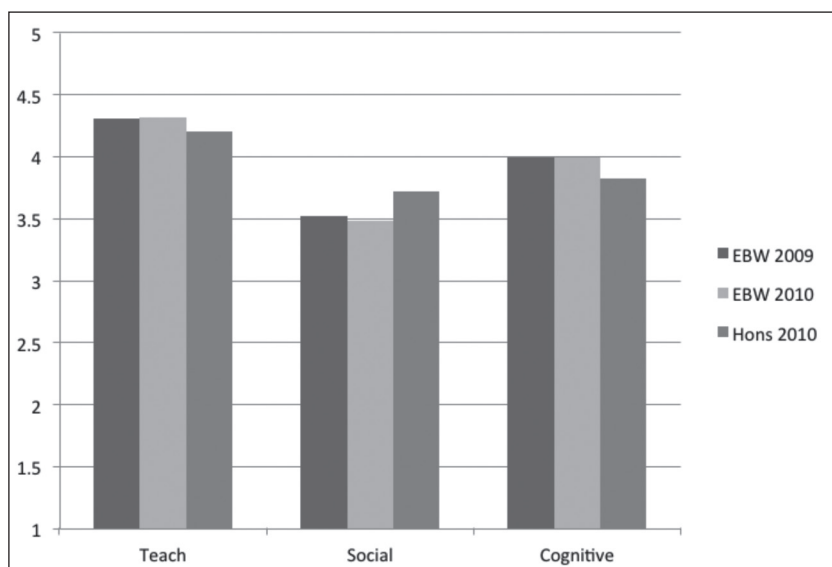


Figure 4: Comparison of the mean scores for the CoI presences

If we compare the average scores for the three CoI presences in three classes, as shown in Figure 4, it is clear that 'teach' was the strongest presence in all

three classes, with ‘cognitive presence’ slightly lower. ‘Social presence’ was the lowest in all three groups, even in the B.Com. Honours class, which had had face-to-face interaction with the lecturer and their peers. The CoI profile for this class followed the same pattern as the distributed students, also with ‘teaching presence’ as the highest and ‘social’ as the lowest. In the Honours group attending class every week, where their lecturer answered all their questions and they had unlimited opportunity to engage in conversation with their peers, the social presence in their class was significantly higher compared to the distributed students’ classes. The low social presence in the distributed class challenges literature on the importance of social presence as a prerequisite for successful e-learning, as in all these classes practically all the students completed their courses successfully, notwithstanding the relatively lower social presence. The history of the course shows that attrition is highest in the dissertation-writing phase in later years.

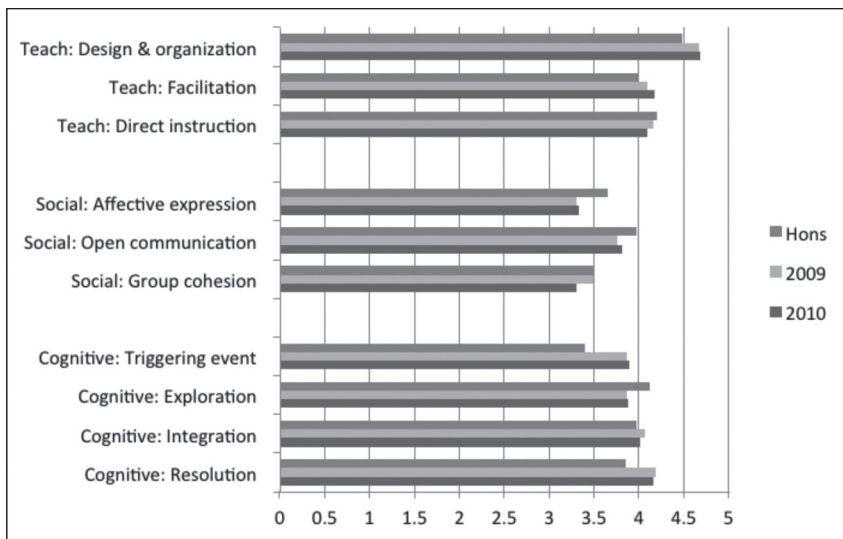


Figure 5: Mean values for CoI elements in three cohorts

Teaching presence

As seen in Figure 5, in the 2009 distributed cohort, ‘design and organisation’ was the strongest element within the teaching presence, confirming previous findings (Nagel and Kotzé 2010). The responses gathered from the 2010 cohort and the blended contact class followed the same pattern, confirming the results. There were no significant differences in the mean scores between the 2009 and 2010 EBW cohorts in any elements, which came as no surprise as these courses

were in all aspects identical, save for the size of the class (reduced from 162 to 113). In ‘teaching presence’ there was also no significant difference between the distributed online class and the class in blended mode, with contact.

Social presence

As regards social presence, Figure 5 shows that the three constructs that comprise Social presence were the weakest in both the 2009 and 2010 distributed cohorts. These results echo the qualitative findings. The lecturer deliberately avoided using the discussions board in the LMS and rather used email for the following reasons: (a) He found the layout of the Discussions tool in this particular LMS confusing, and considering the divergent computer literacy of the students, he did not attempt to teach them online how to use the tool effectively; (b) Students with poor connectivity had better success using email to submit large documents than in the LMS; (c) Email formed an integral part in the document distribution cycle for peer review; (d) The large size of the classes prohibited the use of moderated discussions.

No deliberate attempt was made to incorporate affective expression in the courses. Students’ queries were addressed *en masse* at the end of the week, via email and incorporated into the following version of the class notes. Students did, however experience some measure of openness of communication due to the double-blind nature of the peer review. They felt free to express sincere opinions. A sense of belonging was also fostered through the peer review, as students thought their reviewers understood all facets of their assignments and were capable of making an informed judgement on their work. This form of learning facilitation, conducted mostly by peers, corresponds to the ‘guide-on-the-side’ style, whereas the lecturer’s emails to the class matched the ‘sage on the stage’, both being teaching presences that also contribute somewhat to social presence (Arbaugh 2010). The contact blended class (Hons.), however, had a significantly higher social presence score for affective expression and open communication, compared to that of the distributed students. This illustrated that students were able to form distinct impressions of some of their peers in class and had more opportunity to express themselves. In total, their social presence was still lower than the other presences, which is an indication of a lack of deliberate design to foster social presence, or of utilising class time for such interaction.

Cognitive presence

The strength of cognitive presence signifies students’ ability to construct and confirm meaning as a result of convergent thinking (Richardson and Ice 2010). Figure 5 shows that all four elements of the cognitive presence were strong in all

classes. Resolution is the ultimate event in the Practical Inquiry model (Figure 3), which forms the core of ‘cognitive presence’ (Garrison et al. 2000). The distributed group of students particularly experienced a strong resolution phase. According to research (Richardson and Ice 2010; Shea et al. 2010; Vaughan and Garrison 2005), the discourse in moderated online discussions sometimes fails to progress beyond the third (integration) phase. The strength of resolution in the present courses might be attributed to two factors: the extensive two-tiered peer review process, and an instructional design model that situated all course activities as precursors to the final project. Yet, this does not fully explain the finding. It is meaningful that the classroom blended group (Hons.) had lower scores for triggering events and for resolution, than the distributed students. This difference might be accounted for by the fact that the distributed students chose their own research proposal topics, which the Honours students could not do, as theirs were allocated by the departments. The higher degree of ownership that the distributed students took of the triggering question explains this group’s superior feelings of resolution when their own questions were resolved at the end of the course. This finding also emphasises the importance of a constructivist approach to online learning, where students take ownership of their learning and construct their own knowledge (Bangert 2004; Dalsgaard and Godsk 2007).

Peer review

Students were practically unanimous in their appraisal of the value of the peer review process, as experienced in this context: 94 per cent of the Honours students and 92 per cent of the 2010 distributed students replied that they would be able to produce a better document in future, due to the peer review process. Of the 2010 class of distributed students, 92 per cent would recommend using this process in future. This was confirmed by 94 per cent of the Honours students. Figure 6 shows that practically nobody disagreed with the statement that their peers added value to their document through the review process. There were, however, more ‘agree’ than ‘strongly agree’ responses. Our findings are consistent with those of other researchers, who noted that students are successful when they learn cooperatively, as they learn from their peers and deepen their understanding of the course content (Boud et al. 1999). Peer review is a sustainable method of producing formative assessment in a large class (Boud 2000), as students feel it is a worthwhile experience (Boud and Tyree 1995). Receiving formative feedback helps to facilitate the teaching presence.

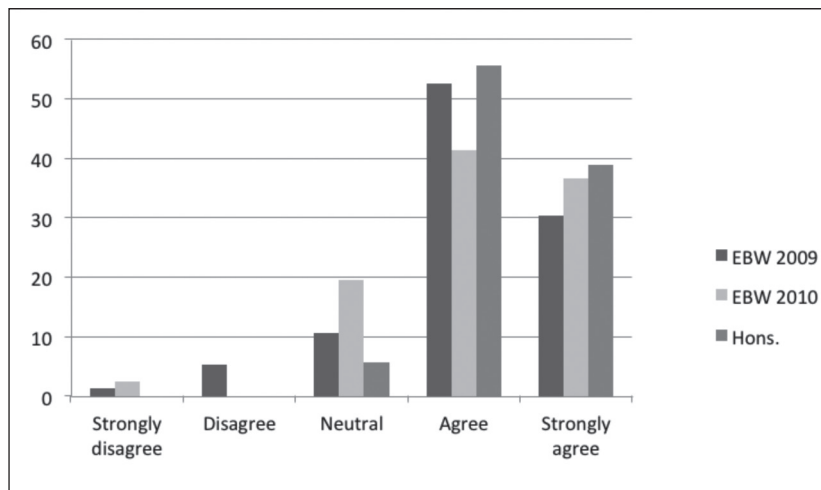


Figure 6: Percentage responses to: My peers added value to my own document by reviewing it

In general, students thought their peers added critical value to their proposals, as they wrote more relevant commentary than an assistant would have done (Gehring 2001). A few students complained about lazy reviewers who scarcely read their paper and added practically no comments. Allocating two reviewers per paper solved this issue to some extent, as did the second tier of evaluation by the original authors of their reviewers. This second tier of review penalised incomplete first-level reviews, and ensured careful and thoughtful reviews, as suggested by Gehring (2001). The majority of students found that their peers contributed to their understanding of the topic and provided them with new insights and perspectives on their research proposals, while highlighting areas needing clarification.

The vast majority of students across all classes thought that it was worthwhile to review other students' proposals, as shown in Figure 7. This finding reveals the ability of asynchronous technologies to enable collaborative learning (Garrison and Kanuka 2004). Students learnt from working through good examples of how others approached their research problems, and from those who made mistakes, thus illustrating the benefits of creating a forum for other adult learners to share their insight (Rossman 1999). Sensitising students to good and bad practice through relevant examples relieves the lecturer from having to give tedious and ineffective feedback (Boud 1995). These findings are congruent with research elsewhere (Turnitin PeerMark webinar, 26 April 2011), that the greatest benefit of peer review is in the *doing*, rather than the *receiving*. Reviewing others' papers

contributed to teaching presence. Furnishing formative feedback to peers created a measure of social presence, as students formed impressions of co-students in their courses.

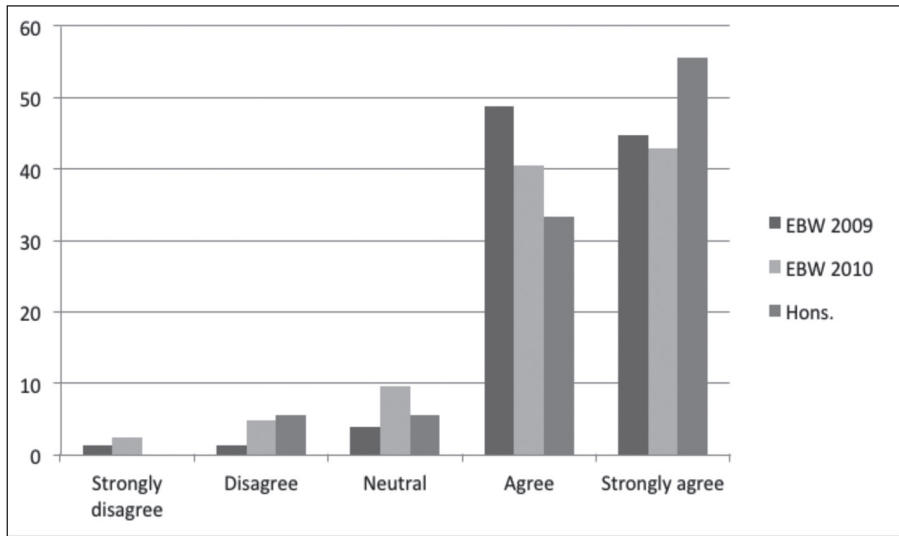


Figure 7: Percentage responses to: Reviewing my peers’ proposals was worthwhile

The only issue that surfaced in the content analysis of the Honours students’ post-course open feedback, was that some would have preferred more communication and clarification between authors and reviewers. The distributed students had divergent experiences of peer review: some recommended greater control of the quality and fairness of the reviews, requesting even more than two reviewers per document and greater clarity regarding the allocation of grades for the process. Some students suggested having another contact session halfway through the course, based on the benefits of the initial contact session. In hindsight, students thought that some explanation and discussion of the peer review process at such a session would help and motivate them to make better use of those opportunities. These qualitative responses crystallise the low social presence score in the course. From the student comments it also surfaced that they had a limited perception of the size of their class or, by implication, the extent of the lecturer’s workload.

The absence of a reliable and comprehensive automatic document distribution system that allows students to perform the reviewing activities offline, and the amount of time and effort required to administer the review process manually to such large cohorts, threaten to derail the future use of this beneficial activity.

The document template

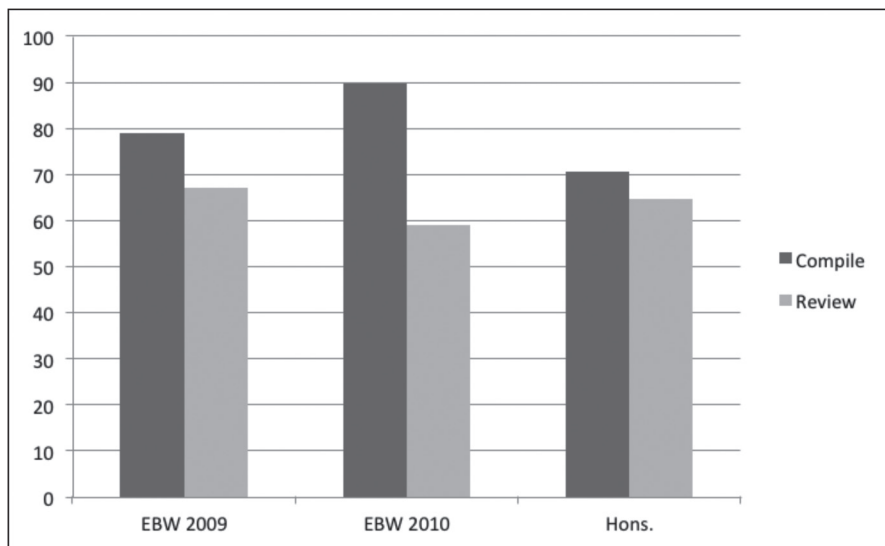


Figure 8: Percentage of students who used the document template

Figure 8 shows that between 70 and 90 per cent of students used the document template to write their documents, whereas only around 60 per cent used it for checking peers' documents. Open-ended feedback indicated that some students spent much time trying to make the tool work, with the main barriers being insufficient computer skills. Numerous students who only had computer access at their workplaces experienced compatibility restraints between the programme and their office computer networks. Those who struggled to compile their own documents did not attempt to use it for reviewing. There was less discrepancy in the more junior (Honours) class, indicating greater familiarity with and access to computer technology. The content analysis indicated that students found the template extremely valuable for correcting careless mistakes and technical errors in their documents. The value of this instrument is that it supported and scaffolded students in the development of their writing skills. In terms of teaching presence, it provided automated facilitation.

CONCLUSIONS

As regards the limitations of the study, we confess that large-scale statistical validation of the instrument in a local context is not feasible at present, as only small numbers of students are enrolled in suitable e-learning courses. Therefore, the interpretation of findings from this study is based on the assumption that the

constructs in the instrument are universal and applicable. The explanation of any significant differences we found depends on the researchers' interpretation of international research, and is informed by the qualitative data from the case studies. After investigating more parameters in future, some of the findings might be reinterpreted.

Regarding the first research question, the CoI proved an extremely valuable instrument with which to benchmark courses and receive student feedback on the success of the design, delivery and facilitation of courses, thus confirming that the expenditure of effort (particularly on the peer review) was warranted. The repeatability of CoI results between two deliveries of the same class in this study confirmed the reliability of the instrument in teaching scenarios different from where the instrument was originally conceptualised.

We attempted to answer the second question – which dealt with teaching a course with minimal contact sessions to a very large class and obtaining acceptable standards of learning and teaching – with the help of the CoI framework. In this study the CoI showed that the strengths of both the postgraduate Research Methodology courses were high teaching presences, harnessing the strength of the online environment, as recommended by Arbaugh (2010). The contribution of effective instructional design and facilitation towards a learning community bears out this finding (Ice 2009; Shea, Li and Pickett 2006). The comprehensive organisation with extensive support materials in the LMS apparently contributed to the high teaching presence evident in the courses, despite differing contact teaching time. More contact time did not improve the teaching presence.

According to the literature, one of the limitations of e-learning is that the resolution and application phase of practical inquiry, which contribute to cognitive presence, do not occur readily in face-to-face or open-ended online discussions (Richardson and Ice 2010; Vaughan and Garrison 2005). In our research, the practically fully online and the contact-dependent blended course both had high cognitive presences. Despite all the time and effort required, the peer review process is a highly beneficial activity that can be employed successfully in relatively large online classes. Peer review helped students to obtain resolution. It contributed to the teaching, social and cognitive presences in our courses, aided by the constructive alignment of the course activities that culminate in the final exam projects. Another factor that contributed significantly to resolution in the cognitive presence was the constructivist teaching approach of allowing students to choose their own problems to solve. The groups who chose their own topics experienced significantly higher triggering and resolution phases than the group whose questions were predetermined. This finding underscores the importance of a constructivist approach to online learning for andragogical learners.

The study did not indicate that including more contact opportunities in a blended delivery mode would necessarily provide a superior learning experience. This confirms the findings of a much larger study (Shea et al. 2006). If the design of online or blended learning does not deliberately foster the development of social presence, such a presence will not develop sufficiently to influence the student learning experience. Unstructured and unmediated interaction does not build social presence.

RECOMMENDATIONS

Peer review is one of the most useful tools for engaging students at deeper levels. Because more than 90 per cent of students in this study would recommend peer review in future courses, coupled with the finding of a high cognitive presence in the course, we suggest that structured double-blind peer review be considered as a viable alternative to moderated online discussions, in order to pursue higher-order thinking (Meyer 2003). Under the present conditions of low connectivity it is a labour-intensive activity to manage, as the administration of submissions and reviews becomes daunting in anything but a very small class. Therefore, it is the subject of constant technology scouting and evaluation. We will continue to evaluate new proprietary software programmes in search of a more suitable mode of peer review. We also have high hopes regarding the future of bandwidth in this and neighbouring countries, which would enable more students to make optimal use of the LMS, as it is not only to their benefit, but will ease the burden on the lecturer.

In courses that do not support real-time communication and feedback, comprehensive feedback from students should be analysed and the essence thereof incorporated into the learning materials for subsequent courses. In such a design research climate, the presence of the student voice will improve the social presence in the classes, as well as the quality of the courses.

Aspects that might influence the CoI and are worthy of scrutiny in the local context are: student demographics; different teaching philosophies; the number and nature of contact sessions; the size of the cohort and available Internet connectivity. Some of these findings can even inform non-electronic distance course delivery, where different technologies are available for course activities. Peer review as a teaching tool is not limited to access through a learning management system, as ordinary email can also distribute documents, as was the case in the courses we studied.

We recommend that the CoI survey be administered in more blended delivery courses for large distributed classes, given that our findings crystallised with

comprehensive case study descriptions and open-ended student feedback. A meta-analysis of CoI outcomes from these courses could inform the design of quality open education courses at those higher education institutions presently committed to blended learning. In such a way, the university can gain indigenous knowledge regarding exemplary practice in our unique context, as different teaching restraints might influence the delivery of locally courses.

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