

Exploring a cross-institutional research collaboration and innovation: Deploying social software and Web 2.0 technologies to investigate online learning designs and interactions in two Australian Universities

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Abstract

One significant manifestation of the proposition of a 'classroom without walls' is the online learning environments evident in most contemporary Australian universities. A key element of the effectiveness of those environments is the quality of the interactions that they foster. Planning and implementing rigorous research into that quality is crucial if these particular 'classrooms without walls' are to deliver enhanced and sustained learning outcomes. This article explores selected aspects of a cross-institutional collaboration linking two Australian universities researching the quality of learning interactions in their online courses. In particular, the authors analyse the utility of the social software and Web 2.0 technologies that have been deployed to facilitate their collaborative research. Despite the constraints and tensions attendant on within- and cross-organisational learning, teaching and research activities, the article records evidence of a developing innovation in investigating both the online learning designs and the research project developed to evaluate the effectiveness and impact of those designs.

Keywords

Cross-institutional collaboration, interactions, online learning design, research, social software, Web 2.0 technologies

Introduction

Although partnerships are usually defined as necessary, pragmatic and benevolent ways of organizing social welfare, in practice they are complex, contradictory and even paradoxical social phenomena.

(Cardini, 2006, p. 394)

This article explores some of the principles and practices of learning design enacted in specific types of interactions evident in selected online courses helping to constitute the “classroom without walls” dimension of two Australian universities. The focus is on the use of social software and Web 2.0 technologies by a research project team comprised of staff members from both universities. The article outlines the possibilities of and the constraints on this particular cross-institutional research collaboration (encapsulated in Cardini’s [2006] statement above) and thereby analyses elements of innovation in both the learning design of the courses under review and the research project investigating the interactions occurring in those courses.

The article consists of the following four sections:

- A selective literature review and conceptual framework
- The study’s research design
- The study’s data collection and analysis
- Concluding implications for maximising innovation in both the learning design of online courses and cross-institutional research projects.

Literature review and conceptual framework

Learning design in online environments is clearly as complex as it is diverse. Online educators are exhorted to promote social presence (Kehrwald, 2007; Lloyd, 2011), to facilitate spiral learning (Schuetze, 2010) and to enact transformative learning (Reushle & Mitchell, 2009). These and other approaches to online learning design are directed at enhancing learner engagement and at maximising successful outcomes for learners and educators alike.

This complexity and diversity are key features of the possibilities for innovation and transformation afforded by online environments. These possibilities range from technology-facilitated authentic learning designs (Oliver, Herrington, Herrington, & Reeves, 2007) to writing non-linear learning resources (Turner, 2007) to using contemporary social software to underpin enduring collaborations among learners, educators and researchers (Duff, Spangenberg, Carter, & Miller, 2010).

A crucial element of effective learning design in online environments is the promotion of meaningful and productive interactions (Saiki, 2010), despite the absence of definitional consensus about such interactions (Beuchot & Bullen, 2005). Current scholarship has demonstrated that interactions are an important element of successful online learning (Su, Bonk, Magjuka, Lui, & Lee, 2005), and that they are inextricably linked with knowledge construction (Rossi, 2010). Interaction types include learner–learner, learner–teacher, learner–content, teacher–teacher, teacher–content and content–content (Anderson, 2008), as well as learner–interface (Hillman, Willis, & Gunawardena, 1994). There are also close connections between specific interaction types and the principles and practices of online learning design (Chou, 2002).

Understandably the scholarship examining online learning continues to grow (Cavanaugh, Barbour, & Clark, 2009; Means, Toyama, Murphy, Bakia, & Jones, 2009). Some of that scholarship has involved cross-institutional research collaborations (Arnold, Ducate, Lomicka, & Lord, 2009), including research into inter-university online delivery projects (Bonk, Lee, Kim, &

Lin, 2009). Some of these research collaborations have been facilitated by the use of social software and Web 2.0 technologies, the latter having been defined “as a second generation, or more personalised, communicative form of the World Wide Web that emphasises active participation, connectivity, collaboration and sharing of knowledge and ideas among users” (McLoughlin & Lee, 2007, p. 665).

Despite these technological affordances, and although cross-institutional research collaborations can yield productive dividends (Davies & Salisbury, 2009), such collaborations are often complex and contested (Kurasawa, 2007). Collaboration has been theorised by D’Amour, Ferrada-Videla, San Martin Rodriguez and Beaulieu (2005) as the interplay of five key concepts: sharing, partnership, power, interdependency and process. Yet they acknowledged that we still have limited comprehension of complex professional relationships, and that much remains to be understood about the connections between the elements and the outputs of collaborations. More broadly, while the cross-institutional research project reported in this article was officially described as a partnership within an agreement endorsed and signed by representatives from both universities and the external funding body, such partnerships often conceal inter- and intra-organisational tensions and sometimes competing interests (Cardini, 2006). As Cardini noted, “external pressures, diversity of motives and purposes amongst partners as well as variations and curtailment of funds often lead to instability, conflict and premature dissolution” (p. 397).

Research design

Despite these conceptual and practical complexities, the members of this collaborative partnership have aspired to reach cross-institutional and multidisciplinary understandings of the patterns, processes and consequences of learner–content, learner–learner and learner–teacher interaction in postgraduate and undergraduate online courses. The study’s research design draws from and builds on previous research conducted by members of the project team. One of these investigations utilised academic analytics to examine the adoption of learning management system (LMS) features and staff and student engagement within online courses (Beer, Jones, & Clark, 2009). Results of this investigation suggested that the analysis of LMS data in conjunction with student results could be used to provide the institution with benchmark information and an indicator of student engagement within online courses. The second investigation examined the processes of and the relationship between learner–learner interaction and knowledge construction within an online communication course, which led to the articulation of a substantive theory about learning relationships in online contexts (Rossi, 2010). The current project has utilised a collective case study approach to respond to the following research questions:

- RQ 1: How do learners interact in online courses?
- RQ 2: What are the patterns, processes and consequences of learner–learner and learner–teacher interaction in online contexts?

Five online courses were purposefully selected as cases within the study. Case study facilitates the investigation of contemporary phenomena in real-life settings. It is also an effective means of uncovering contextual conditions through different forms of evidence (Baxter & Jack, 2008; Yin, 2003). One or more phenomena may be selected as a unit of analysis when its characteristics are thought to have significant implications for the case being investigated (Patton, 2002). An embedded case design, such as the one employed in this study, offers the opportunity to emphasise different aspects of each course and provides multiple foci for the analysis of data which facilitates the identification of different levels at which statements about conclusions may be made (Yin, 2003). Learner–learner interaction, learner–teacher interaction and learner–content interaction constituted discrete units of analysis within this cross-institutional study.

The course selected as a case within Rossi’s (2010) investigation served as a pilot within the current investigation. The additional four cases included an online postgraduate and undergraduate level course offered by each educational institution. Figure 1 outlines the processes associated with a case study approach, demonstrates the relationship between these processes and the collaborative research project discussed within this article and illustrates the complexity of the phenomena being

examined. The substantive theory and associated model constructed to illustrate the key aspects in the development of learning relationships in online contexts (Rossi, 2010) served as a tool through which to view data from the current study.

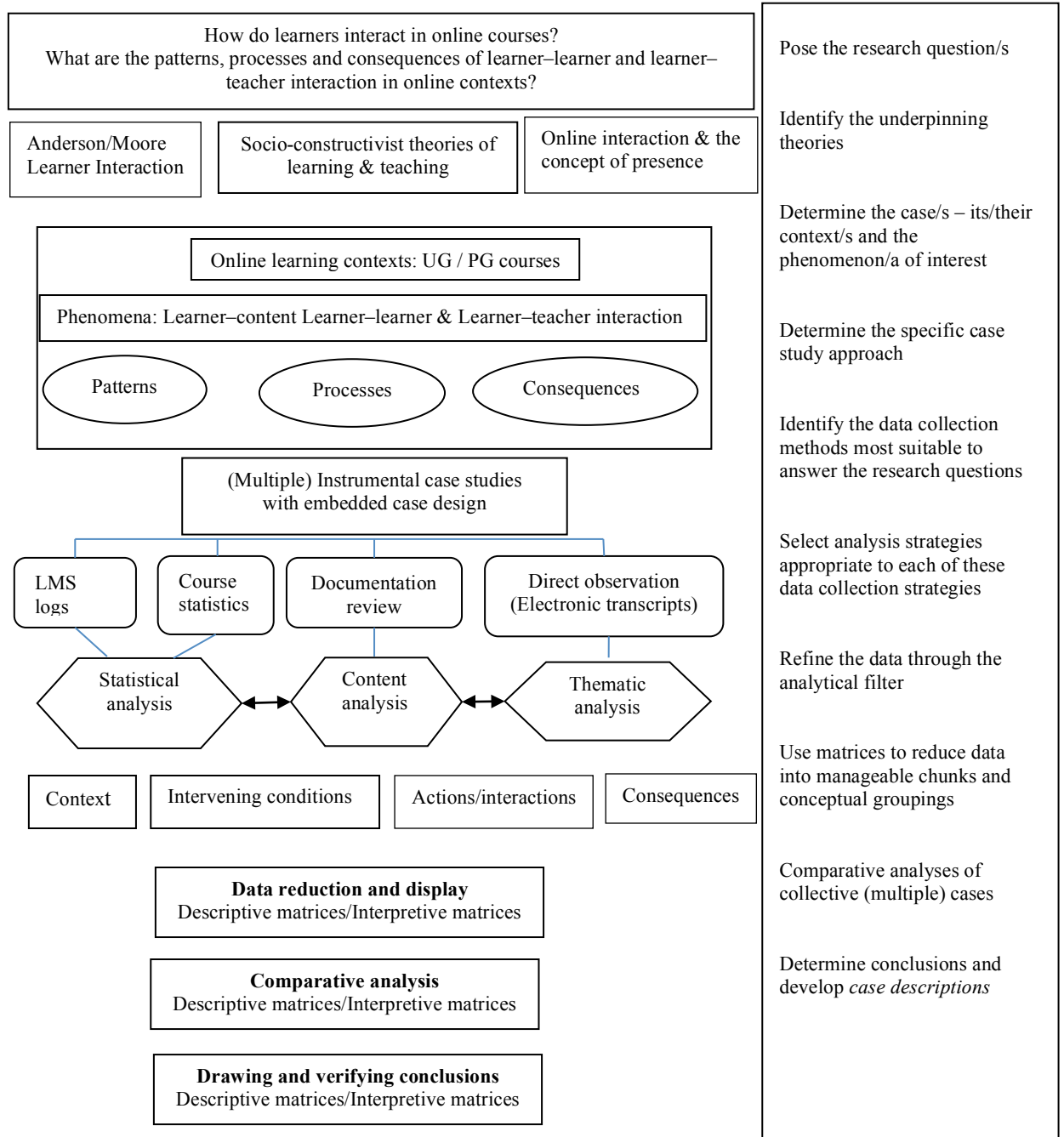


Figure 1. Case study schematic (adapted from Rosenberg & Yates, 2007)

Within the framework afforded by this research design, the component of the research project focusing on the cross-institutional collaborative dimension of the study was facilitated by the use of social software and Web 2.0 technologies to collect and analyse the data reported below. We see that use as contributing to the emergent innovation that we elaborate below as characterising

the research collaboration as well as the online course design at the centre of that collaboration.

Data collection and analysis

Social software and Web 2.0 technologies were integrally involved in the collection and analysis of the data related to this parallel study of the online learning designs and interactions and of the cross-institutional research collaboration investigating those designs and interactions. For ease of presentation, we discuss these two elements of the study separately in this section of the article, then we distil common implications of these elements in the conclusion below.

Online learning designs and interactions

The principal sources of data within the study of the online learning designs and interactions were electronic transcripts, retrieved retrospectively from an archive of each of the five courses, and selected as a case. Additional data included information obtained from non-interactive, static records produced by the LMS in the form of system logs and course statistics, and program and course documentation. The LMS for the pilot course was Blackboard and for the other courses was Moodle, which is the LMS used at present by both universities. The analysis of these data is currently proceeding using NVivo software and framed by the research questions outlined above.

The proposition of a “classroom without walls” is commonly associated with e-learning, online education and virtual delivery of that education (Lai & Ng, 2011; Raffaghelli & Richieri, 2010). The aspirations attendant on this proposition were encapsulated in the statement that “The so-called ‘classroom without walls’ may soon become the classroom without boundaries that supports continuous learning on demand as we exchange skills for access, knowledge for acquisition, and experience for relationships” (Atkinson, 2009, p. 31). Certainly the analysis to date of the online learning designs and interactions confirm the existence of several distinctive affordances of educational technologies that make possible new forms of student engagement and learning. On the other hand, that analysis highlights the complexity of learning and teaching in online environments. It demonstrates also that any enactment of these distinctive affordances and possibilities is neither automatic nor easy, but instead occurs only as the result of working simultaneously across a range of fronts.

Indeed, without wishing to pre-empt the subsequent findings of the ongoing analysis of the five courses, there are emerging indications from that analysis of the confirmation – and in some areas potentially the elaboration – of the elements of a theory of online learning depicted in Figure 2. These elements were distilled in Rossi’s (2010) grounded theory study of what became the pilot study in this investigation. At the same time, given that the project has broadened the focus to include learner–learner and learner–content as well as learner–learner interactions, it is likely that the analysis will yield outcomes that contribute to extending current understandings of the centrality of interactions in sustainable online learning and of the principles and practices of effective learning design necessary to facilitating that learning.

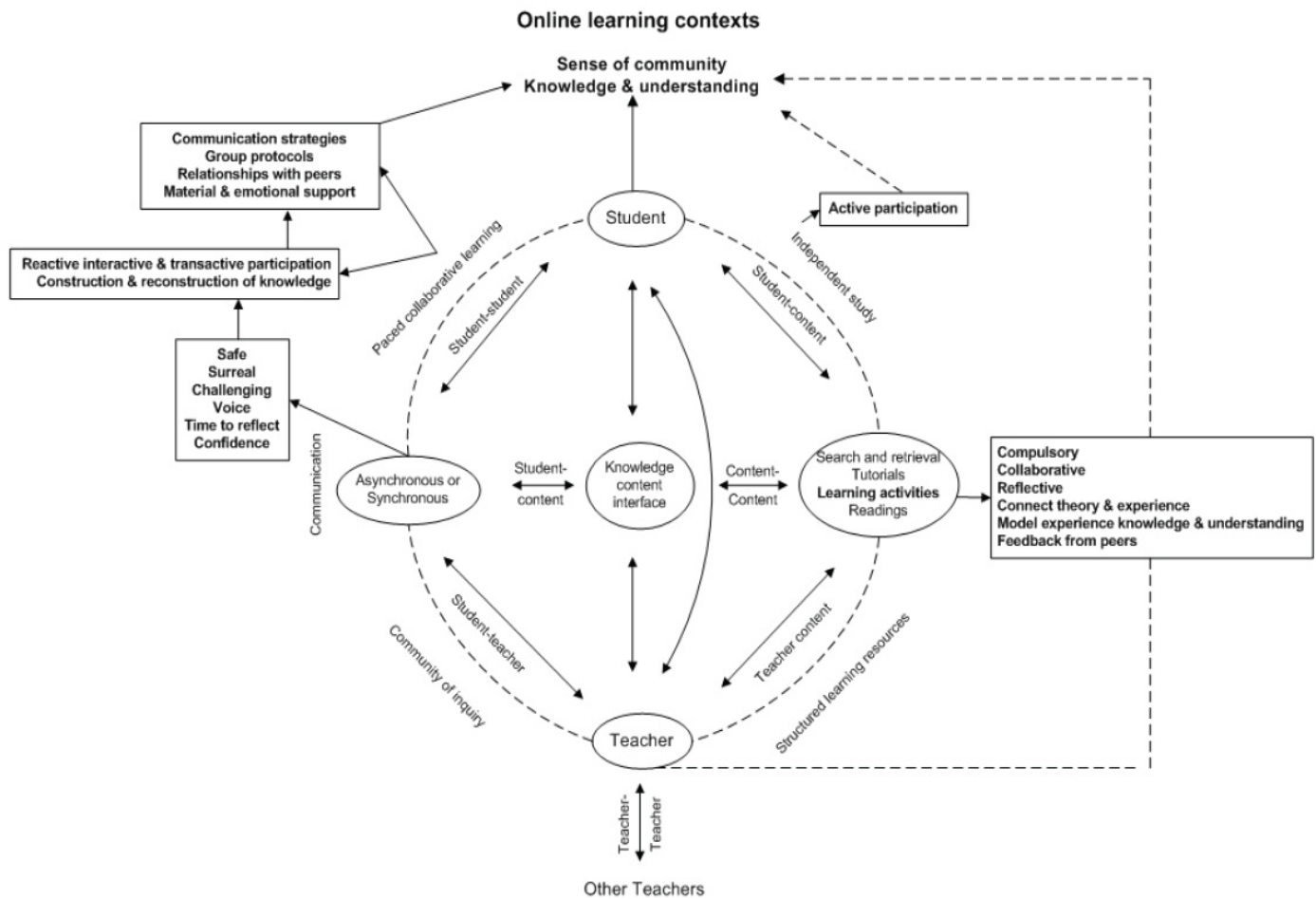


Figure 2. Elements of a theory of online learning (Rossi, 2010, p. 234)

Cross-institutional research collaboration

The cross-institutional research collaboration was pursued through a number of interaction types that provided the data analysed here about this component of the study. These interactions included a fortnightly videoconference, occasional teleconferences, regular and ongoing emails across the project team as a whole and among individual team members, a two-day face-to-face meeting at one of the universities (to be followed by an equivalent meeting at the other university in the final third segment of the funding period) and several efforts to use contemporary research collaboration software in order to create, manage, share and disseminate the team's developing knowledge base. These efforts drew on Google Docs (<http://www.google.com/google-d-s/b1.html>), Dropbox (<http://www.dropbox.com/>), the data fabric technology of the eResearch Collaborative Services provided by the Australian Research Collaboration Service (<http://www.arcs.org.au/>) and a wiki that will be progressively developed to report the project's findings.

One crucial set of issues in this research collaboration was clustered around negotiating organisational approvals in each university. These approvals related to submitting the project proposal, agreeing to the version of the project approved by the external funding body, obtaining human ethics panel approval for subsequent analysis of student data at the end of each selected course and one university assigning to the other access to student data from two of those courses so that the other university could apply its academic analytics software to those courses. While all

these approvals have been gained, each took more time and involved more discussion and documentation than we had anticipated at the outset of the project.

More broadly, the complexity of obtaining these approvals highlights key features of contemporary universities and of the work and identities of those who work in them. These features include ongoing competition for scarce resources, heightened managerialism, work intensification, blurred role boundaries and reduced autonomy (see also Bexley, James, & Arkoudis, 2011). These administrative and cultural challenges in implementing effective cross-institutional research collaborations are offset by the development and enhancement of dynamic professional relationships that often extend beyond individuals moving from one university to another and that provide a vital foundation for the bureaucratic dimension of the collaborations. Indeed, these relationships have often ensured the continuation of the project when it might have foundered at times when making progress in dislodging seemingly insurmountable obstacles has appeared difficult and stressful. (Importantly, the same points can be made in relation to collaboration across different sections within the same university – for example, schools, faculties and divisions, research centres, the research office including human ethics and research funding, technical support and the legal office.)

This same interplay between obstacles to collaboration and professional relationships that have found solutions to those obstacles has been evident in the project team's efforts to use social software and Web 2.0 technologies to create, manage, share and disseminate our knowledge of the project and our developing research findings. We continue to experiment with means of communicating among ourselves and with multiple others in ways that use the affordances of particular technologies as effectively and efficiently as possible. For example, this article was developed using email attachments; future publications are likely to use collaborative software such as Google Docs. We have found that the take up of specific technologies has been influenced by diverse technical knowledge and technological experience within the team, varied understandings of research and publishing, and different ways of working that have emerged over time and that are sometimes resistant to change. Perhaps inevitably these efforts at enhancing our cross-institutional research collaboration have entailed continuing trial and error and have highlighted the need for time to practise using specific technologies before these technologies are incorporated into our separate and shared research practices.

Conclusion

This article has identified several constraints on the extent to which social software and Web 2.0 technologies have been successfully incorporated into the online learning designs and interactions and into the cross-institutional research project currently exploring those designs and interactions. These constraints have clustered around individuals' and groups' capacities and preparedness to engage wholeheartedly and dialogically with the technologies and with the other participants in the courses and the project. Wider issues such as organisational context and direction and sector-wide shifts in teaching, learning and research priorities have influenced those capacities.

Despite these constraints, there is developing evidence of indicators of innovation in both the online learning designs and interactions and the cross-institutional research collaboration outlined above. For example, course-specific strategies have been demonstrated as being successful in promoting sustainable learner–learner, learner–teacher and learner–context interactions in different ways across the five courses analysed to date in the project. Similarly, there are instances of highly effective learning design in selected aspects of the courses, including in matching course goals and assessment tasks and in using the activity logs afforded by the LMS as a trigger for monitoring student engagement and for ongoing course evaluation. Likewise the writing of the technical scripts for the academic analytics (Beer, Jones, & Clark, 2009) and the grounded theory study (Rossi, 2010) leading to the pilot study in this project constitute significant contributions to

extending existing theoretical, methodological and practice-based knowledge that augur well for the current analysis of the main study.

In combination, these constraints on and indicators of innovation suggest a number of implications for enhancing the prospects for innovation in learning design and research collaboration alike. First, recalling that innovation is as much about the transformation of practice as it is about the creation of new ideas (Denning, 2004) is a timely reminder that practice is often deeply engrained over time and can take equivalent time to change and transform. Second, innovation depends as much on the trust and goodwill of participants as it does on externally circulated possibilities for change and transformation. Third, the social and cultural dimensions of technologies are as significant as their technical features in influencing their take up in particular contexts for specific purposes. Fourth, conducting teaching, learning and researching in online environments affords distinctive possibilities but also creates certain complexities that can prevent those possibilities from being realised.

All of this suggests that online learning designs and interactions, and cross-institutional research collaborations to investigate those designs and interactions, can certainly create new ways of working cross-culturally and inter-organisationally. Furthermore, they can generate effective and sustainable innovations that can arise from new ideas and that can transform taken-for-granted practice. Moreover, social software and Web 2.0 technologies can play crucial roles in supporting and disseminating these new ways of working and innovations. At the same time, all these possibilities are constrained by the limitations of collaborations and partnerships (Cardini, 2006; D'Amour, Ferrada-Videla, San Martin Rodriguez, & Beaulieu, 2005) noted above. We look forward to elaborating the interplay between these possibilities and constraints as the research project continues to unfold.

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