The practice of web conferencing: Where are we now?

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The use of web conferencing tools to support learning and teaching and facilitate interaction and collaboration is common in many higher education environments as is the replacement of face-to-face meetings with virtual collaboration tools. This paper reports on Phase 3 of a trial of web conferencing conducted at a regional Australian university and further explores the use of web conferencing to support and enhance learning and teaching. Preliminary findings from Phases 1 and 2 of the trial have been reported on in a previous paper. The action research method which framed the initial trial has again been applied to Phase 3. In Phase 1, collaborative mathematical problem-solving in an undergraduate course was carried out using web conferencing and tablet PCs. In addition, students in postgraduate Education courses were linked across the globe to participate in interactive and collaborative web conference activity. In Phase 2, a university-wide trial across disciplines was conducted. Phase 3 represents an analysis of feedback received from teachers who were involved in Phases 1 and 2 and who have had some time to reflect on the impact web conferencing has had on their teaching practice. From this, and their own experience, the authors make further observations regarding the use of web conferencing to support learning and teaching and raise a number of questions and issues to guide future research.

Keywords: web conferencing; action research; evaluation; collaboration

Introduction

The trial of web conferencing at the University of Southern Queensland (USQ) was initiated by the authors' need to address certain pedagogical and technical requirements. A defining characteristic of USQ is that more than seventy-five percent of the twenty-six thousand students are studying at a distance in local, national and international locations. Many live in remote areas with no access to face-to-face study groups and a large percentage of students are of mature age, working full-time and fitting part-time study into their busy schedule.

Given the regional spread of students in this university, the gap between the service provided to on-campus and off-campus students has to be considered. To reduce this gap, a pedagogical solution was sought that enabled sharing of the interactive elements of classes irrespective of physical location. One solution was a "virtual classroom" where synchronous communication is available in text, audio and video media. Most web conferencing software packages provide real time, internet-based collaboration by combining a number of tools including instant messaging (text chat), VoIP (voice over IP) audio conferencing, video conferencing, shared whiteboard, and shared application or desktop. The use of web conferencing tools can enable the incorporation of activities that build key graduate attributes of communication and team work skills through interaction with peers and teaching staff.

The two authors experimented with a web conferencing tool with postgraduate education and undergraduate mathematics students. Results from this trial were reported to university management who acknowledged that a more unified, university supported approach was essential, making the technology accessible for every staff member and not only the technologically curious and proficient. This led to Phase 2 – a university-wide trial of web conferencing aiming to identify faculty-specific pedagogical requirements and the suitability of the package in meeting those requirements. Preliminary results from Phases 1 and 2 have been reported previously (Reushle & Loch, 2008) and are revisited and extended in this paper. The paper then reports on Phase 3 of the trial where some of the original participants are asked

to reflect on the impact web conferencing has had on their teaching practice. In Phase 3, additional feedback has been collected, analysed and used to frame further recommendations and raise additional points for future research.

Theoretical framework used to support the conduct of the trial

A qualitative action research method was used to frame the design and conduct of the trial. The method was an adaptation of Salmon's (2002) framework and was considered suitable because it had already been applied successfully to an online action research study in a higher education business school (Salmon, 2002) and then to a study of collaboration with teachers from a polytechnic in Singapore to build the professional capacity of the group in the area of online learning (Reushle, 2005). The method, illustrated in Figure 1 and using a phased approach provides an iterative, cyclical process to develop, implement, evaluate, and modify the trial process and make recommendations for future action.
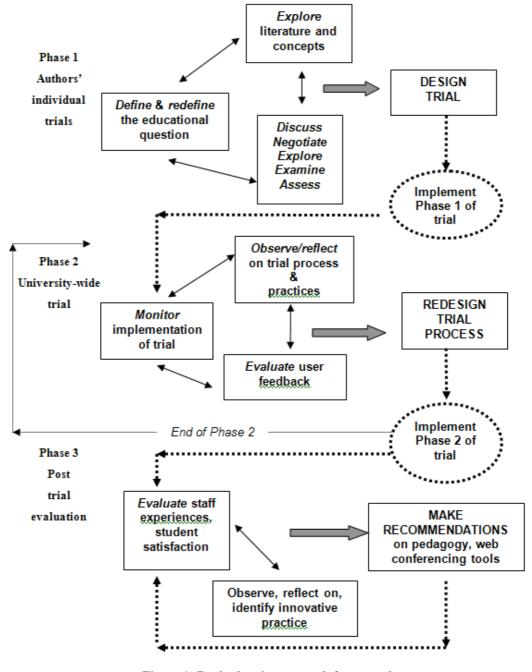

Figure 1: Revised action research framework

The trial process: Phase 1

The educational need to create more interactive, collaborative and engaging learning environments with learners at a distance was considered by both authors. After some exploration of the literature and a variety of synchronous tools, the opportunity to trial a web conferencing software package (Elluminate *Live!*) at USQ arose in late 2006. One of the authors trialled the software in two postgraduate online courses in the Faculty of Education. Features identified of most value to the Faculty of Education students included interactive and collaborative opportunities, enhanced social presence and sense of community. The other author used the web conferencing software with undergraduate mathematics students because specialised tools for online communication and the option to write or draw on a (synchronous) shared whiteboard while talking about a topic through a text or voice based channel were not available through the standard Learning Management System. While asynchronous discussion groups have been shown to be very successful in socio-constructivist learning paradigms (Birch & Volkov, 2005), they tend not to be utilised as much for symbol-based communication in areas such as sciences, mathematics or statistics. Web conferencing tools identified by teaching staff as fundamental for mathematics learning were (apart from the audio component), the shared whiteboard, the pointing tool used to highlight areas of the whiteboard, the graphing calculator and the ability to application share.

The trial process: Phase 2

After implementing and monitoring Phase 1, reflecting on the processes and practices and evaluating user feedback, it was evident to the authors that a more formal approach was required in order to promote the concept of web conferencing and recruit more trial users. This formalisation of the trial represented Phase 2 of the process. A number of introductory training sessions were conducted and staff members were asked to volunteer their time if they wanted to participate in the web conferencing evaluation.

Approximately sixty staff members expressed their interest in the trial and out of those, twenty responded to a questionnaire designed to seeking feedback on their experiences. Preliminary findings from Phase 2 of the trial were reported by Reushle and Loch (2008) and initial recommendations were made to the university community.

The trial process – Phase 3

Phase 3 of the trial represents a further analysis of the views of some teachers involved in Phases 1 and 2 who have had some time to reflect on the impact web conferencing has had on their teaching practice. This phase has also provided an opportunity for the authors to reflect on the trial and posit further questions, opinions, issues and recommendations regarding the use of web conferencing technologies to support learning and teaching.

Following the trial of web conferencing software, USQ purchased a licence for a tool for 2008. In July 2008, nine months after the completion of the official trial, another short questionnaire was sent to a number of participants from the Phase 2 trial who would have had the chance to continue using web conferencing in their teaching. The four questions asked were:

1. What are your thoughts about using web conferencing to support learning and teaching?
2. Have your teaching method(s) changed as a result of using web conferencing? In what way/s?
3. Which challenges have you identified in your use of web conferencing (e.g., technical, access and equity, pedagogical limitations)?
4. What additional training would support your effective use of web conferencing?

Four academic staff responded, and their views are used later in this paper to raise additional issues and to guide future recommendations.

Literature review

The dynamic nature of teaching in general requires teachers to be continually evaluating the learning situation in order to promote and nurture an atmosphere that supports the development of new ideas, the challenging of old, and the exploration of alternatives. This does not suggest that using new technologies requires new teaching methods. Laurillard (2002, p. 1) urges higher education institutions to "meet the demands of the knowledge society and take full advantage of the possibilities technology presents" rather than perpetuating more traditional teaching methods. However Mayes (2002) makes the point that new technologies don't lead inevitably to major change in education.

In constructivist learning situations, the teacher assumes the role of mediator, modeller, motivator, consultant, advisor-counsellor, researcher and resource provider, expert questioner and provocateur, and member of a peer learning team sharing control with the learner as fellow-learner (Goodyear, Salmon, Spector, Steeples & Tickner, 2001). The multiple roles of the teacher indicate that teachers are very important to learners. In an NCVER report (NCVER, 2003), it is noted that rather than removing teachers from the learning equation, integral to the whole process of learning are interactive, responsive teachers.

A study conducted by Vitaras, Rowe and Ellis (2008) on the use of a web-based conferencing system (Elluminate Live!) at their higher education institution reported that external students felt more connected and engaged with their teacher and fellow students. Support of teachers and clear information on the use of the technology were identified as critical to the success of the implementation of the system. Web conferencing has the potential to bring distance learners closer together, build community and enable interactive and collaborative activity that facilitates joint construction of knowledge (Siemens, 2004). This is supported by a study conducted by Little, Passmore and Schullo (2006, ¶7) who found that the advantages of synchronous classroom sessions include "more direct interaction, immediate feedback, and a strong contribution to team building". Reushle and Loch (2008, p. 24) noted in their paper on Phases 1 and 2 of the trial that web conferencing needs to be "accessible for on campus and distance inexperienced and advanced computer users, on dial up and broadband and available in remote locations and major centres. It should also run on different operating systems (e.g., Windows, Mac and Linux) with minimum extra hardware/software requirements". Much has been written about technology use in education levelling the playing field by giving students and teachers who are challenged by their circumstances access to the education they need to succeed in the 21st century (Star, 2008; Pearson, 2001). Alternatively, it is also essential that services are accessible to people with disabilities, people who are from diverse backgrounds or are in other situations that limit access to electronic sites and resources.

The visibility of discourse (Reushle, 2005) sets electronic learning environments apart from other settings and provides an excellent opportunity for formal, vicarious learning where participants in the learning process can "watch" others learn (McKendree & Mayes, 1997). Despite the visibility, the environment also enables a certain degree of anonymity. Disinhibition (Suler, 2004) is one of the more frequently mentioned effects of online learning. It is sometimes described as the increased likelihood that a shy student will speak up, for example, or that students will be more forthright. This aligns with Lapadat's (2002) observation that online environments democratise participation in that the teacher is less likely to dominate, and the learners have equal opportunity to contribute to discussions, assuming the variables of technology access, language usage, and typing skills are reasonably equitable. In the web conferencing trial, a lecturer noted that "what would usually make some students feel uneasy in a real classroom…I would get them to do virtually on the whiteboard – stand up and do a calculation in front of everyone!" (Teacher 1, Phase 1).

Impact on practice: Where are we now?

The following questions emerged from the conduct of all phases of the trial. Responses are drawn from teacher and student feedback along with observations and opinions from the authors of this paper. The authors' role in this study was that of collaborative practitioner researchers, with some elements of participative observation (Murphy & Torrance, 1987). In this role, the authors needed to be reflective practitioners (Schön, 1991) and their participation in the research study was central to the study in that their presence formed part of the research design. Schön (1991) distinguishes between reflection in action (thinking that takes place in the midst of practice, rather than after the event), and reflection on action (reflection after practice has been completed), and acknowledges the cycles of thought that take place and the link with, and impact on, action. While the second author was actively using web conferencing for teaching in Phase 1 only, the first author continued to offer web conferencing tutorials during Phase 2, interacted with other trial participants, and provided additional feedback from both the researcher and practitioner points of view.

Question 1: Why use web conferencing?

A number of purposes for using web conferencing have been identified. Technology should not be used simply for technology's sake and it is imperative that the educational benefits for the individual and the institution are clearly communicated to teachers and students. An important reason for using web conferencing at USQ is to improve communication with the large distance student population. One advantage web conferencing software has over many other technologies is that it provides a suite of tools within one environment. For disciplines such as mathematics and science, interactive visual and aural

communication conducted from a personal computer is of significant advantage when discussing complex concepts. A teacher provided this comment:

> Web conferencing has added an important dimension to communicating mathematical explanation to distance students. I've moved from explaining mathematics on the phone with no visual support or via the text-based discussion group with no audio, to synchronous handwritten or typed chat, and now to web conferencing, where I can have audio and video together, with handwriting or typing. It's a natural progression – I think I've found the best way to explain maths to distance students so far and allow them to give me immediate feedback. I can make recordings of live classes available. I trialled with a small group of students, and could see that I was making a difference to their understanding. Others who were unable to join simply watched the recordings. It was a very rewarding experience (Teacher 1, Phase 3).

Another teacher (Teacher 2, Phase 3) observed that her teaching practice had been enhanced through the use of web conferencing by encouraging a sense of community and the easy ability to clarify questions through voice rather than text only.

Many institutions globally include web conferencing in their suite of educational technologies. For USQ, effective and innovative use of web conferencing may contribute to its reputation and competitive edge in distance and online education and will support exploration of new ways of enhancing learning and teaching. It is vital for a modern, flexible, distance education institution to provide staff and students with efficient communication tools to support pedagogical innovation and research activity. Initial evaluation findings reveal that through web conferencing, external students feel engaged and connected, which may lead to better student evaluations, higher university ranking and additional government funding (Reushle & Loch, 2008).

Question 2: Does the effective use of synchronous tools such as web conferencing require a new pedagogy?

Evidence of some change in pedagogical approaches prompted by the use of web conferencing has been noted during this trial. However, there is also evidence of more traditional approaches being perpetuated using the web conferencing technologies. One can ask, should web conferencing be conducted as one might conduct a face-to-face tutorial and should any distinction be made between on-campus students and distance students and their participation? Should web conferencing be conducted from a classroom-type environment or from one's office desktop computer – and does it matter? Should attendance at a session be mandatory and should participation be an assessable item? When should sessions be conducted and should several sessions be conducted to accommodate students in different time zones or with competing commitments?

A foreign language teacher tasked with the development of an online program for distance delivery noted that web conferencing will be essential to the design of speaking and listening activities. She perceives web conferencing as the ideal tool to bridge the communication gap between on campus and distance learners. At the same time, she acknowledged that teaching methods will need to change as a result of using web conferencing: "Yes, much change will be necessary" (Teacher 3, Phase 3).

A teacher experienced with embedding technologies into his courses said that he welcomed the addition of web conferencing as a tool to support and enhance his pedagogical approaches (Teacher 4, Phase 3). He also stressed that it is essential to identify the added value of synchronous communication to the staff and student experience. Some teachers simply extended their classes to an online audience by broadcasting live from the lecture room. Others explored special weekend tutorials to include as many students who work (in paid employment) as possible.

Another teacher observed that the added dimension of working with students both inside and outside of the classroom needs to be a seamless teaching process, rather than being an add-on (Teacher 1, Phase 3). She noted that in a situation where remote participants are linked only by audio ("they cannot see us, we cannot see them"), it often takes only a matter of minutes to forget that they are there. Another teacher who had offered weekend tutorials commented: "Large classes too can create certain problems ensuring everyone gets a turn to contribute" (Teacher 5, Phase 3).

Individual examples of pedagogic approaches have been mentioned. More experimentation is needed to develop rigorous methods that weave web conferencing into the curriculum. The challenge for many teachers is how to integrate web conferencing with traditional academic practice.

Question 3: What is the student perspective?

Web conferencing allows distance students to participate in live activities with each other and with the teacher. A student usually enrolled on campus but taking a course via distance study over the summer semester noted that "this was the perfect way to communicate with others while studying externally" (Student 1, Phase 1). Also, use of the web conferencing tool "creates a more personal feeling of interaction between students and teachers which is not normally found when studying externally and helps to alleviate feelings of isolation." This student participated in most of the sessions offered throughout the semester.

However, an optimal approach for one student may not fit into the study schedule of another. At USQ, students enroll at a distance for two reasons – they appreciate the flexibility offered by distance study and/or they are physically located a distance from the university and cannot attend classes. This flexibility includes access to study material which means that attending a web conferencing class at a fixed time may not suit but the ability to view a recording of a web conferencing session in their own time might. A student noted that the session he/she was able to attend "was very helpful… the recorded session was also very helpful. The sessions need to be recorded as commitments do not always allow attendance [at a fixed time]" (Student 2, Phase 1).

Question 4: What are the implications for staff when introducing widespread use of a technology such as web conferencing?

Web conferencing requires the interplay of a variety of technologies, such as audio, video, typed chat, screen sharing and collaboration on a whiteboard. While some tools may be used more than others, at least two-way audio for the teacher and students appears to be necessary for a successful session.

Teachers who are used to communicating with distance students through asynchronous discussion groups may find the immediacy of this communication combined with the reliance on technology daunting, may focus on the technology rather than the teaching, and may approach web conferencing with a negative attitude. This attitude may be overcome through shared pedagogical practice with experienced users and targeted (possibly even one-on-one) training in technology use and related problem solving strategies. Asked what additional training would support their effective use of web conferencing (final question, Phase 3 questionnaire), two respondents mentioned that they would like to see more training on pedagogical aspects and the embedding of the technology in their teaching, not on the technical aspects. Another said that teachers new to the tool would require further support, and the fourth asked for more one-on-one support.

The authors observe that careful change management can result in a successful trial and bridge the trial period with mainstream deployment of a technology. If the trial is facilitated by teachers with practical experience and personal interest in its success, the chances are higher that they will be able to motivate and engage others to participate. If these change "leaders" are encouraged to continue into the mainstream phase of educational technology integration, this momentum may drive the next stage of its use. While staff training is an important component, it is equally important that teachers do not perceive the introduction of a new technology as a prescribed addition to their practice without inclusion in workload.

Question 5: How can "value for money" be measured at this early stage of adopting a new technology?

There is a tendency for Australian universities to follow a business model, and to place a value for money or return on investment figure on a technological tool. The authors were asked by university management to identify such figures at the conclusion of the trial, but instead focused their responses on pedagogical and reputational benefits. At trial stage, where all participants volunteer time and web conferencing is an add-on, it is difficult to measure from institutional and economic points of view if this is a worthwhile innovation. For instance, participation in online classes is sometimes lower than one would experience in face-to-face classes. However, recordings are made available in many courses, so a measure of value should take into account live participants as well as those who access the recording afterwards. This information is not available from the trial, as the software was not hosted on a university server.

In addition to identifying value for money for the tool at the institutional level, each faculty needs to determine if the workload can be justified if only a handful of students attend. This decision may be made based on usage data collected for individual courses, and it may also depend on particular technical needs for courses and educational outcomes for participants.

Budgeting for web conferencing needs to account for licensing and annual maintenance costs as well as student and staff support. At least at the introductory stage, training costs for staff, students and administrators should be considered, together with the "hidden" costs of staff and students "acclimatising" to a new system.

Question 6: Are there institutional processes and practices that should be in place before a new technology and/or new approach becomes mainstream?

In the first weeks of Phase 2, technical and equipment issues needed to be addressed at USQ including headset and webcam availability. Before web conferencing can be integrated as a mainstream tool, existing technical equipment may need to be upgraded. For instance, to broadcast live classes with local attendance to a remote audience, the teacher must have a microphone and to capture student interaction, a roaming microphone is recommended. Loudspeakers and microphones need to be set up with echo cancelling software, and web camera placement needs to be considered carefully to capture as much activity as possible. These are issues that need to be addressed at an institutional level, with policies and procedures in place to maintain and support the infrastructure.

Issues that can impact the teacher and student experience

While the following issues may apply to other e-learning initiatives such as the use of online discussions, podcasting or e-assessment, USQ academic staff expressed concerns about these issues in the context of web conferencing.

Building trust in the technology

As one of the participants pointed out, the first time use of web conferencing is "often scary for both staff and students" (Teacher 2, Phase 3). It is important that the technology works reliably and is relatively intuitive to use from the beginning, so staff and students can build trust in the tools to support learning and teaching. Some teachers who experienced difficulties with equipment (e.g., an ineffective headset) decided not to use web conferencing with their students because they thought they could not rely on the technology (Phase 2 feedback).

Proper integration from the outset

Some staff members commented that seamless integration into the course or program curriculum from the outset is important for successful use of the technology (Phase 2 feedback). This means clarifying student expectations early regarding attendance options and obligations. This can be compared to the existing requirements of student workload as outlined in course specifications. It is important to regard web conferencing as a means to achieve pedagogical goals, not as an additional obligation to be imposed on teachers and students.

Workload allocation

The issue of workload allocation was raised several times in staff feedback. All trial participants volunteered their time as they were excited by the prospect of testing a new technology that might enhance their learning and teaching. However, for web conferencing to be accepted as a learning medium, classes will need to be resourced as are standard face-to-face classes. This means time allocations for preparation and facilitation, as well as staff and student training to become proficient in the use of the tools.

Difficulty agreeing on a time

USQ's distance students often work part or full time in addition to their university studies and also lead busy family lives. Several USQ academic staff identified that it is often impossible to find mutually agreeable time slots that accommodate all students and that this needs to be factored in from the outset and for equity reasons, alternatives must be made available. A number of teachers made this observation (Phase 2 feedback).

Flexibility comes from asynchronicity

A comment from a teacher was that "flexibility comes from asynchronicity" (Teacher 4, Phase 3). Expecting distance students to join synchronous classes may meet with resistance given that many of these students choose distance study for the flexibility it offers. This highlights the tension between flexibility, and interactive and collaborative learning. Learners often initially choose to study at a distance because of the belief that it offers a flexible, "in your own time, in your own place, at your own pace" opportunity to engage in learning experiences. However, the facilities afforded by technology enhanced environments such as those using web conferencing include technologies which, by their very nature, encourage synchronous interactive and collaborative learning opportunities. The promise of "flexibility" and the recognised impact of interactivity and collaboration on deep learning, results in a tension in how best to exploit this environment.

Conclusions and future research

Early in 2008, the authors reported preliminary results from Phases 1 and 2 of the web conferencing trial at their institution. The findings supported the adoption of web conferencing as a pedagogical tool which led to its inclusion in the University's Learning and Teaching Plan and other policy documents and its adoption as a pilot technology within the university's Learning Management System in semester 2 2008.

Phase 3 of the trial has provided opportunities for the authors to reflect further on their own experiences and the experiences of others in using web conferencing technology. As a result, the authors are able to pose additional questions, raise further issues and suggest directions for future investigation. Adoption of web conferencing software is seen as a significant step in supporting the student learning journey and providing graduates with skills demanded by future employers, for example, the ability to work effectively in teams and to be able to communicate in the workplace (Wood, 2007). While specific to the USQ context, many of the questions raised and observations made in this paper and the other by Reushle and Loch (2008) could apply to other institutions either considering the adoption of web conferencing tools or involved in their own pilot projects.

An additional question that has emerged is whether the relevance and methods of using of a particular tool within a web conferencing suite of tools is dependent on the discipline. Preliminary findings suggest that the answer to this question may be "yes" given that web conferencing used in a mathematics course was successful because the whiteboard made it possible to share mathematical formulae and problem development. On the other hand, in an introductory computing course, the whiteboard was not used for content-related purposes. In this context, sharing the screen and showing how to use software was more important. In a statistics course which included the study of relevant software, both tools were vital for instructor and students. Where there is a clear need for whiteboard writing, video of the presenter becomes unimportant as all activity is happening on the whiteboard. In a mathematics course, only the teacher had access to a web camera to broadcast video of the presenter, and it was used at the beginning of the semester only. Since the web conferencing software showed who was speaking at the time and explanations in mathematics are usually done with pen and paper, sessions focused on the whiteboard and audio chat, rather than video or typed chat. Not all participants needed to be able to speak to be active contributors.

There will always be students who will just watch rather than talk, or may choose to use typed chat only. This doesn't mean that they are getting less out of the session. One of the authors observed that an external international student was quite happy to type answers into the chat window, but did not like to turn on her microphone. In disciplines where emphasis is not on written material (e.g. in a debate), video becomes vital to read an opponent's body language and behaviour and satisfies the need for a visual component. We expect that the importance of a tool for a particular discipline as observed in Phases 1, 2 and 3 may change once local expertise in web conferencing use has been developed, and new possibilities for integrating web conferencing into learning and teaching have been explored.

Support for technologies that enable synchronous online activity does not imply the end of other approaches to learning and teaching such as asynchronous interaction and collaboration, nor does it suggest that face-to-face learning and "place-bound interactions" should be abolished. The online environment signifies "parallel and alternative forms of human interaction and discourse" (Anderson & Kanuka, 2003, p. 7). These parallel forms are not essentially better, or worse, than other forms of interaction and education. However, network-enhanced interaction can fulfil some pragmatic human needs at certain points in time by providing access, convenience, flexibility, utility, speed, and cost-

effectiveness. Education is a powerful tool in the global educational environment and the Internet has enabled a new era in human collective activity.

References

Anderson, T. & Kanuka, (2003). *E-Research: Methods, strategies, and issues*. Boston: Pearson Education.

Birch, D. & Volkov, M. (2005). Students' perceptions of compulsory asynchronous online discussion. *Australian and New Zealand Marketing Academy (ANZMAC) Conference 2005: Broadening the Boundaries,* 05-07 December, Fremantle, Western Australia.

Goodyear, P., Salmon, G., Spector, M., Steeples, C., & Tickner, S. (2001). Competencies of online teaching: A special report. *Educational Technology Research & Development, 49*(1), 65-72.

Lapadat, J. (2002). Written interaction: A key component in online learning. *JCMC, 7*(4). http://jcmc.indiana.edu/vol7/issue4/lapadat.html [viewed 11 October 2008].

Laurillard, D. (2002, January/February). Rethinking teaching for the knowledge society. *EDUCAUSE,* 16-25.

Little, B., Passmore, D. & Schullo, S. (2006). Using synchronous software in web-based nursing courses. *CIN: Computers, Informatics, Nursing, 24*(6), 317-325. http://cms.nursingcenter.com/dev/prodev/cearticleprint.asp?CE_ID=679134 [viewed 10 Oct 2008].

Mayes, T. (2002). The technology of learning in a social world. In R. Harrison, F. Reeve, A. Hanson, & J. Clarke, (Eds.), *Supporting lifelong learning: Vol. 1, Perspectives on learning*. Routledge: London.

McKendree, J. & Mayes, J. T. (1997). "The vicarious learner": Investigating the benefits of observing peer dialogues. *CAL'97*. http://www.media.uwe.ac.uk/masoud/cal-97/papers/mckendre.htm [viewed 6 Jan 2005]. (no longer available)

Murphy, R. & Torrance, H. (1987). (Eds.). *Evaluating education: Issues and methods*. Milton Keynes: Open University Press.

NCVER (2003). Flexibility through online learning: At a glance. SA: Leabrook. http://www.ncver.edu.au/research/proj/nr1F12/nr1F12.pdf

Pearson, S. (2001). Summary of a Forum Series on leveling the playing field - Technology as an equalizer in education, transition to careers and daily life. Washington, DC: American Youth Policy Forum.

Reushle, S. E. (2005). *Inquiry into a transformative approach to professional development for online educators*. Unpublished doctoral thesis, USQ. http://eprints.usq.edu.au/1494/

Reushle, S. E. (2006). A framework for designing higher education e-learning environments. *E-Learn 2006 World Conference on E-Learning in Corporate, Government, Healthcare, & Higher Education*, 13-17 Oct., Hawaii: Honolulu. http://eprints.usq.edu.au/1226

Reushle, S. & Loch, B. (2008). Conducting a trial of web conferencing software: Why, how, and perceptions from the coalface. *Turkish Online Journal of Distance Education, 9*(3), 19-28.

Salmon, G. (2000). Learning submarines: Raising the periscopes. http://www.flexiblelearning.net.au/nw2000/main/key03.htm

Schön, D. A. (1991). *The reflective practitioner: How professionals think in action*. England: Ashgate Publishing Ltd.

Siemens, G. (2004). Connectivism: A learning theory for the digital age. *elearnspace everything elearning*. http://www.elearnspace.org/Articles/connectivism.htm [viewed 2 July 2008].

Star, L. (2008). Tech solutions for special kids. *Education World*. http://www.education-world.com/a_tech/tech/tech224.shtml [viewed 2 July 2008].

Suler, J. (2004). The online disinhibition effect. http://www.rider.edu/users/suler/psycyber/disinhibit.html [viewed 30 September 2008].

Vitaras, P., Rowe, S. & Ellis, A. (2008). Student's first experiences with a Web conferencing system – preliminary findings. *AusWeb The Fourteenth Australasian World Wide Web Conference*. Ballina: Ballina Beach Resort. http://ausweb.scu.edu.au/aw08/papers/refereed/vitaras/paper.html

Wood, L. (2007). Classroom notes: The transition to professional work. *Australian Mathematical Society Gazette, 34*(5), 246-52. http://www.austms.org.au/Publ/Gazette/2007/Nov07/ClassroomNotes.pdf [viewed 10 Oct 2008].

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