CONDUCTING A TRIAL OF WEB CONFERENCING SOFTWARE: Why, How, and Perceptions from the Coalface

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ABSTRACT

This paper reports on the trial of web conferencing software conducted at a regional Australian university with a significant distance population. The paper shares preliminary findings, the views of participants and recommendations for future activity. To design and conduct the trial, an action research method was chosen because it is participative and grounded in experience, reflecting the context and objectives of the trial. In the first phase of the trial, students in postgraduate Education courses were linked across the globe to participate in interactive and collaborative conference activity and to communicate via audio, text, and video and shared whiteboard. Mathematical problem-solving was carried out collaboratively in an undergraduate course using tablet PCs. This was followed by phase 2, a university-wide trial across disciplines. Preliminary findings indicate that web conferencing software enables teachers and students at the university to engage actively across diverse locations, supporting a student-centred approach and greater flexibility in terms of where, when and how students learn. From these findings, the authors have made some initial recommendations to university management on the adoption of web conferencing to support learning and teaching.

Keywords: **Web conferencing; distance education; online learning; action research**

INTRODUCTION AND CONTEXT OF TRIAL

The use of web conferencing software to support learning and teaching and facilitate interaction and collaboration is becoming mainstream in many higher education environments across the world (Dalsgaard, 2006; The New Media Consortium, 2006). Replacing face-to-face meetings with virtual collaboration tools, working on a daily basis with colleagues thousands of kilometres away, or attending a conference held entirely online is not unusual.

Web conferencing software can provide real time, internet-based collaboration and generally includes tools such as instant messaging (text chat), VoIP (voice over IP) audio conferencing, video conferencing, shared whiteboard and shared application or desktop. Most web conferencing software packages combine a number of these tools. This paper reports on a trial of a particular web conferencing suite, Elluminate Live! (Elluminate), used for learning and teaching at the University of Southern Queensland (USQ). It draws on current literature and the personal experiences of the teachers and students using the software to support pedagogical goals.

A defining characteristic of USQ is that more than three quarters of the twenty-six thousand enrolled students are studying at a distance in local, national and international locations.

Many live in remote areas with no access to libraries or face-to-face study groups. Moreover, a large percentage of students are of mature age, working full-time and fitting part-time study into their busy schedule.

After early trials at the university with audiographic technology in the 1990s (Harman & Dorman, 1998), this technology was abandoned as it required student and instructor to attend sessions in dedicated rooms and therefore lacked flexibility (Rowe, Ellis & Bao, 2006) and did not reach all students. Since then, online deliberations at USQ have tended to be focused on learning management systems (LMS), with online material delivery and asynchronous and synchronous text-based discussions. Current literature warns of the risks of this approach and outlines how new technologies have taken online pedagogy far beyond the current large LMSs. The literature supports using a collection of tools to build loosely connected learning environments rather than a single tightly focused environment with limited tools (Thompson, 2007; Kulathuramaiyer & Maurer, 2007; Dalsgaard, 2006).

While asynchronous discussion groups have been shown to be very successful in socio-constructivist learning paradigms, for example in the context of a business course (Birch & Volkov, 2005), they tend not to be utilised for symbol-based communication in areas such as sciences, mathematics or statistics. Some disciplines require specialised tools for online communication not necessarily available through standard LMSs (Smith & Ferguson, 2004), for instance the option to write or draw on a (synchronous) shared whiteboard while being able to talk about a topic through a text or voice based channel. The lack of such tools and frustration for instructors and students led to experimentation by individuals at the university with a variety of web collaboration tools. A free synchronous chat client that allows handwritten posts was tested in the disciplines of mathematics and statistics (Loch & McDonald, 2007). Other studies conducted at the university exploring innovative tools include the work by de Byl and Taylor (2007) who investigate the Web 2.0 ethos with respect to the application of pedagogy within 3D online virtual environments, and the research by Hafeez-Baig and Danaher (2007) into using mobile learning technologies.

The trial of the web conferencing tool described in this paper originated from the authors' interest in finding an approach that fulfilled their pedagogical and technical needs. The two authors initially experimented with the tool with postgraduate education and undergraduate mathematics students. Results from this trial were reported to university management, who then 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 the tool aiming to identify faculty-specific pedagogical requirements and the suitability of the tool in meeting those requirements.

THEORETICAL FRAMEWORK TO SUPPORT THE CONDUCT OF THE TRIAL

Use of technology, particularly the Internet, can provide learning environments, contexts and authentic "worlds" which students can experience and explore. With the advent of computer-based instruction and the ever-growing capabilities of technology, researchers and educators are linking constructivism and the use of technology with learning (Reushle, 2006). It is proposed that learners construct their own meaning from information and that one way of effectively constructing that knowledge is through joint construction with other learners (social constructivism).

The authors see web conferencing software as a powerful tool to connect students located across the globe enabling interactive and collaborative activity that facilitates this joint construction of knowledge. In addition, the learning theory for the digital age proposed by George Siemens (2004), connectivism, also had a significant influence on the decision to trial web conferencing software at USQ.

A research method that is participative and grounded in experience was required that would reflect the context and objectives of the web conferencing software trial. For this purpose, a qualitative action research method originally developed by Salmon (2002) and adapted by Reushle (2005) was modified to design and conduct the trial.

This method, illustrated in Figure: 1 and provided an iterative, cyclical process to develop, implement, evaluate, and modify the trial process which consisted of two phases. Phase 1 represents the trial conducted individually by the two authors of this paper. The outcomes of Phase 1 were evaluated, leading to Phase 2 which broadened the original activity to include more members of the university learning and teaching community.

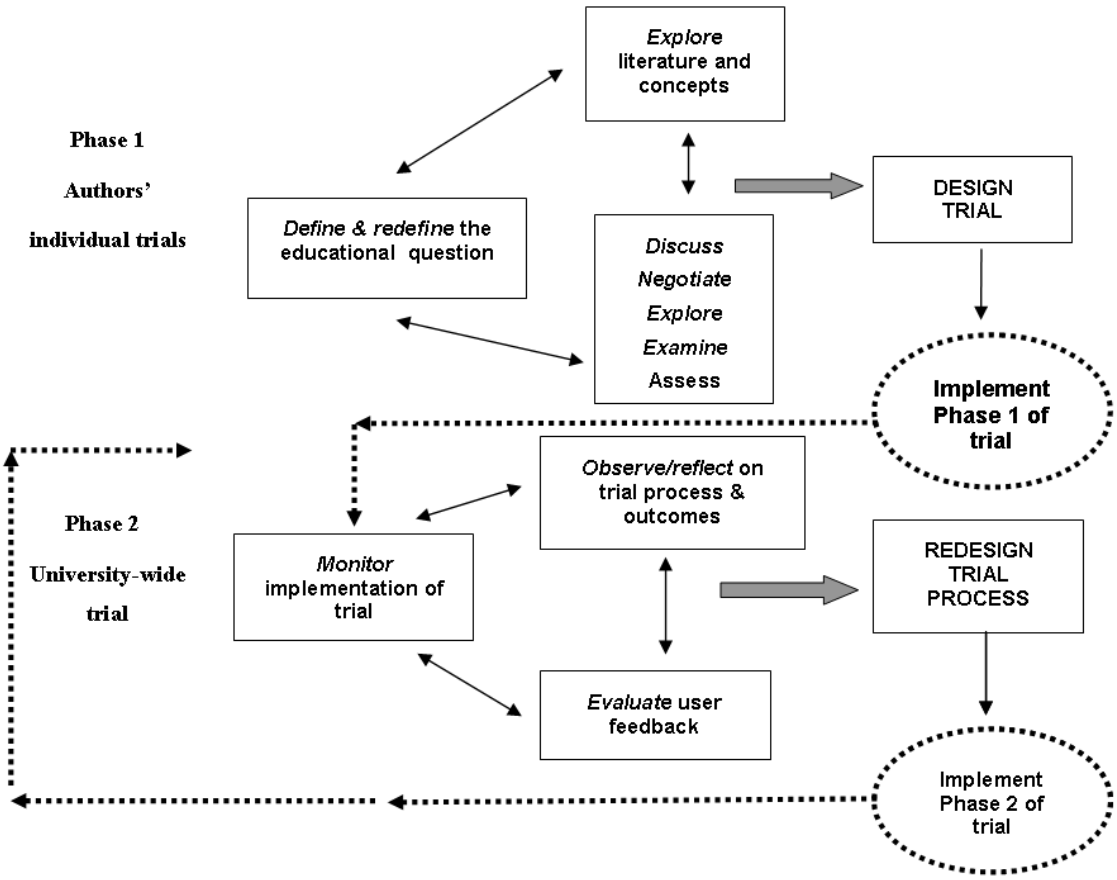

Figure: 1
Action Research Framework

Analysis has been conducted in a cyclical way throughout the process of the trial with emerging insights and identification of trends shaping and refining its focus. This analysis continues as further data from the trial is collected.

The Trial Process – Phase 1

Elluminate Live! was chosen as the web conferencing software and the trial commenced in late 2006. The first author trialled the software in two postgraduate fully online courses in the Faculty of Education and then the second author used Elluminate with undergraduate mathematics students. Elluminate is an integrated web conferencing environment providing (among other features) instant text messaging, audio conferencing, video conferencing, shared whiteboard, shared window or desktop, and a session recording function. Elluminate was the preferred choice of web conferencing software because of its cross platform functionality, its handling of slow (dial-up) as well as broadband internet speeds and because it appeared to offer all that other commercial tools offer plus more features. These additional features include quick and good quality writing on the shared whiteboard with input devices of diverse levels of resolution (ranging from touchpad to tablet PC stylus), the ability to point out sections of the whiteboard to everyone by everyone using a visible pointer, WebTours

(useful to jointly check course material, or assignment instructions), a shared graphing calculator and the ability to share anyone's screen (for instance to assist students struggling with mathematical computer algebra systems, and for software walk throughs).

In the Faculty of Education, Elluminate was used to link postgraduate students across the globe to participate in interactive and collaborative activity. Students communicated with their teacher and each other via audio, video and text chat and collaboratively explored literature and developed academic publications.

The software assisted in creating authentic (real world) assessment activity that involved students interacting with peers and sharing academic ideas in a virtual conference environment.

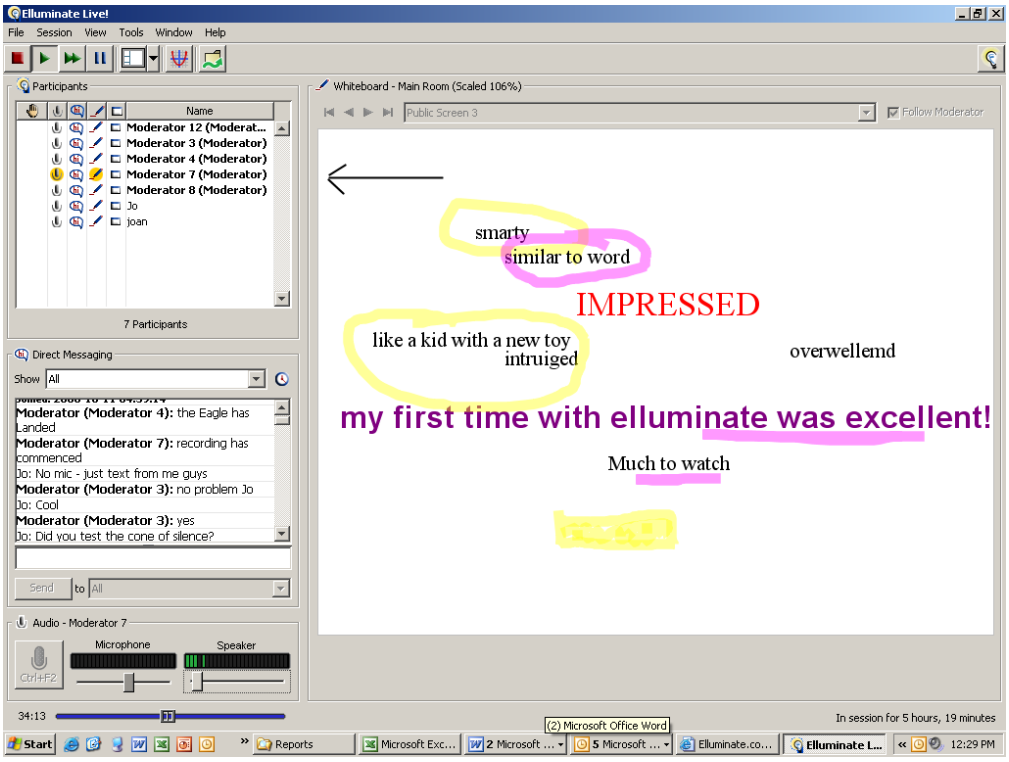

Figure: 2
Brainstorming in an Education course - shared whiteboard, audio and text chat

The shared whiteboard provided a facility for virtual conference presentations (using PowerPoint slides) but also enabled students to actively participate in the preparation of the presentations through annotating the slides and collaboratively brainstorming ideas (Figure: 2).

The sessions were recorded for later reviewing and supported by further asynchronous discussion conducted within the university learning management system.

Elluminate was one of a number of tools that was tested in the Faculty of Sciences with volunteer students in a mathematics course where the focus was on using electronic writing of mathematical symbols on the shared whiteboard (Figure: 3) while voice-chatting with every participant.

This was an extension of a text and handwriting chat study conducted in a previous semester (Loch & McDonald, 2007).

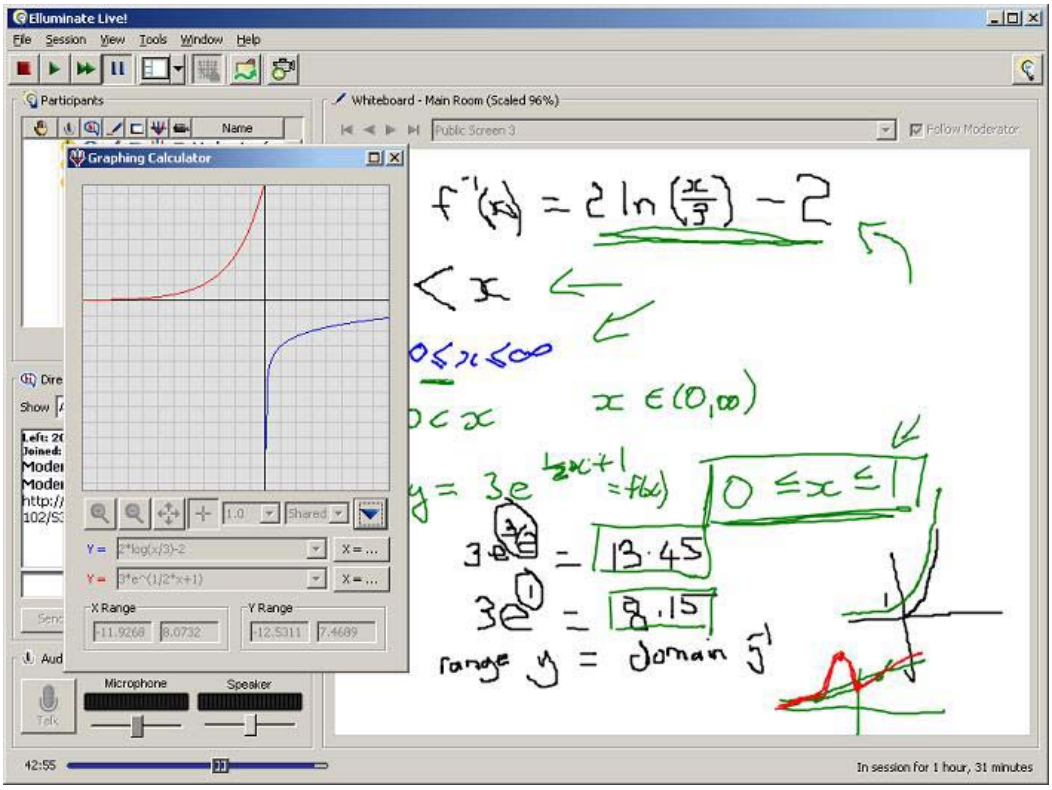

Figure: 3
Exploring mathematics concepts interactively with shared whiteboard, graphing calculator and audio and text

Participant Perceptions

Perceptions from students in the Faculty of Education conveyed support for Phase 1 of the trial. Features identified of most value to these students included the interactive and collaborative opportunities, enhanced social presence and sense of community:

> ***The Elluminate events were the highlight of this course for me. I enjoyed the interaction and hearing the fellow learners' voices. It added a degree of humanness to the virtual environment. I am now much more enthusiastic about collaborative work online and the potential of online groups to produce quality work. I am keen to use this much more in my practice … to create a community of inquiry where learners are fully engaged and responsible learners …to create and sustain a sense of community***

> ***A fascinating outcome was the gradual move away from the use of traditional tools to the newer technologies for collaboration. In the end,*** **[the Learning Management System]** ***became somewhat of a backwater which had interesting ramifications from an 'LMS' perspective. Having been totally absorbed with supporting the LMS in my own university this was quite a revelation and somewhat liberating as well.***

Elluminate tools identified by teaching staff as essential for mathematics learning were (apart from the audio component), the shared whiteboard which enabled the adding of new slides without losing what had been written before. Other features that were appreciated were the pointing tool used to highlight areas of the whiteboard, the graphing calculator and the ability to application share. Video of the speaker was not seen as important by teachers or students. A mathematics student reported:

> ***I found my use of Elluminate a highly rewarding experience. The benefits of this system start with the ease of communication; through voice and visually with the whiteboard. This was the perfect way to communicate with others***

while studying externally, Elluminate allowed the ability to be understood and to demonstrate complicated working out simply and effectively. In the past I have had experience with mailing lists and **[the Learning Management System]** ***but found that I did not rely on these areas for help due to the difficulty in explaining a problem, (especially mathematical or science based), and the length of time waiting for a reply. Elluminate also creates a more personal feeling of interaction between students and moderators which is not normally found when studying externally and helps to alleviate feelings of isolation. Elluminate is easy to use and has extra tools to help highlight main points in the discussion. I have really enjoyed my experience with the Elluminate tutorials and highly recommend it.***

The Trial Process – Phase 2

After monitoring Phase 1 and reflecting on the process, 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. As the initial trial period drew to a close, the trial was extended to the end of 2007. This represented Phase 2 of the trial. Two introduction sessions, endorsed by university management, were offered at the beginning of the second semester, as well as a number of sessions to give staff members introductory training. All staff members were required to volunteer their time if they wanted to participate in the Elluminate evaluation.

Approximately sixty staff members signed up on the Elluminate Support Moodle site at the beginning of the semester. Out of those, twenty responded to a questionnaire designed to seek feedback on their experiences.

Six of those twenty did not use Elluminate in that semester, as they were either not teaching, were planning to use the software in the following semester, or had not been able to find the time to experiment with this tool. All staff members involved in the trial reported that the student feedback had been excellent, and most staff members were impressed with the opportunities web conferencing offers.

FINDINGS FROM THE COALFACE

At the time of writing, Phase 2 of the trial has just concluded and further data is being collected from participants across the university. However, preliminary findings which formed initial recommendations to university management are summarised in this section. While specific to the USQ context, many of these recommendations could apply to other institutions considering the adoption of web conferencing tools.

The software package 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. Technical support and training must be available, and installation needs to be as simple as possible. An ideal system contains a recording option to capture the session for later replay, and editing functionality. Through some preliminary investigation, it was determined that one combined system to fit most needs would reduce training, management and maintenance costs.

Given the regional spread of students in this university, the gap between the service provided to on-campus and off-campus students must be considered. In some disciplines, much of the aural and whiteboard information is currently only shared with the on-campus students. Responses to questions asked by these students (usually of the faculty member) are only heard by on-campus students or, in fact, attendees of the class activity.

This "soft information" is not captured and shared with all students of a course and can be a major disadvantage in the learning experiences of students at a distance.

To reduce this gap, USQ needs a pedagogical solution that allows classes to be captured and shared by all students. In addition, all students at a distance need to have the option to be part of a live class (should they wish) and interact with the class, asking their own question as well as hearing responses to class attendees' questions.

This solution is a "virtual classroom" where synchronous communications is available in text, audio and video media. 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 interim evaluation conducted in Phase 2 has some interesting findings. Seven faculty members (out of the twenty who responded to a questionnaire) used Elluminate on a regular basis in Phase 2, in the following discipline areas: Psychology, Education, Statistics, Law and Computing. Largest participation was recorded for the twice-weekly Psychology sessions which included live lecture broadcasts and Saturday morning tutorials. Although initially hesitant, the teacher's use of the synchronous communication tool was very successful, an outcome which was supported by student feedback.Low student attendance was reported by some staff members, citing difficulties in agreeing on times, and the preference by some students for asynchronous study (particularly when recordings were made available afterwards).

This finding agrees with outcomes from research conducted by Loch and McDonald (2007) and the findings from the Phase 1 mathematics tutorials. Faculty members have commented that synchronous sessions need to be built into the course from the outset, and not be treated as a last-minute add-on.

Some teaching staff experienced technical problems, which were usually addressed promptly with support from the technology support area. Students generally seemed to find it easier to set up their computers than staff, as many staff members do not have administrator rights on their computers.

Initial evaluation findings have revealed that through web conferencing, external students feel engaged and connected, which may lead to better student evaluations, higher university ranking and additional government funding. Faculty members have predicted an increase in retention for courses perceived as difficult such as mathematics and statistics as teachers are able to keep regular contact with remote students and intervention measures can be taken when student difficulties are exposed.

Use of this software is proving time-saving for teaching staff as student questions can be answered in real time and information needs to be delivered only once. The recording feature of the software means that those responses are also captured for later review. Some issues of equity between on campus and distance students are being addressed where the perceived advantage of live lecture and tutorial participation is also available to distance students.

Feedback from faculty members has revealed their use of the software to invite guest speakers from across the globe to contribute to their students' learning experience and the ability to collaborate with colleagues world wide on research and publication work. Faculty members have also observed the following in their courses:

- **students are more aware that they are part of a cohort of students who are experiencing the same challenges and can support each other;**
- **there has been a reduction in student anxiety in statistics service courses;**
- **direct help in using software in computing courses has replaced long, imprecise written or verbal instructions;**
- **visual explanation of symbol-based courses such as mathematics has been made possible;**
- **some students have experienced increased awareness of assessment methodology and teacher expectations;**

- **a better service has been provided to distance students; and**
- **use of the software has supported the establishment of social presence, particularly at the beginning of a semester.**

RECOMMENDATIONS AND CONCLUSIONS

Towards the end of the trial, university management has requested tangible figures of the value for money of web conferencing. While easy to quantify, the number of participants per session should not be the sole measure to identify the value of web conferencing to an institution. The benefits lie in the availability of synchronous communication when required, e.g., to replace one-to-one phone conversations as well as sessions with larger groups, to conduct collaborative brainstorming sessions, and to make available recordings of sessions to all students. The ease of use of a web conferencing tool and the availability of required features in one tool is important for staff and student uptake.

For the institution, effective use of a tool such as Elluminate may contribute to its reputation in distance and online education and will enable 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. However, it is equally vital that the institution provide ongoing support and resources for such tools.

Therefore, budgeting for the introduction of web conferencing software does need to account for training costs, student and staff support, administrator training, and annual maintenance costs. It should also address the "hidden" costs to faculty staff acclimatising to a new system.

For many faculty staff members, web conferencing is breaking new ground and very few, if any, are trained in the use of the tools. Web conferencing software development is a fast-evolving field and the functions of each product, and the number of products, are constantly changing.

Some staff members reported that they were afraid of the constant changing of technology, which places them in the ongoing position of a beginner, and expressed their hope for a consistent approach with one fully supported tool at university level

For successful integration of web conferencing software, it is important to assure teaching staff that a software package will be available for at least a reasonable period of time. Staff training in the technical aspects of web conferencing tools and related problem solving strategies, as well as in pedagogical approaches is vital for successful use of such tools.

The trial described in this paper has demonstrated the importance of adopting web conferencing as a pedagogical tool, and has led to its inclusion in the University's Learning and Teaching Plan and other policy documents.

Implementation of web conferencing software is seen as a major step forward in improving the study experience and provide graduates with skills demanded by future employers, for example, the ability to work effectively in teams and to be able to communicate mathematical ideas in the workplace (Wood, 2007).

As this trial draws to a close, more data is being collected and analysed to guide future developments in web conferencing and related learning innovations. These findings and recommendations will be reported on at a later stage.

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