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Uniting face-to-face and remote students using rich-media real-time collaboration tools

Final Report 2014

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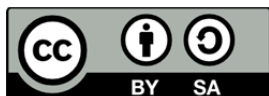
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<http://blendsync.org>



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Executive summary

The Blended Synchronous Learning Project sought to investigate how rich-media technologies such as web conferencing, desktop video conferencing and virtual worlds could be used to effectively unite remote and face-to-face students in the same live classes. Increasingly university students are opting to learn from off-campus, often due to work, family and social commitments (Gosper, et al., 2008; James, Krause, & Jennings, 2010). Typically universities will cater for remote students by providing access to asynchronous resources via Learning Management Systems, meaning that off-campus students miss out on the benefits of synchronous collaborative learning such as rapid teacher feedback, real-time peer discussions, and an enhanced sense of connectedness.

The first major activity of the project was a scoping study to determine the types of rich-media synchronous technologies that Australian and New Zealand tertiary educators had been using and why they were using them. The results from the 750 respondents indicated that the use of rich-media technologies for learning and teaching had experienced over a decade of strong growth, with desktop video conferencing used for more incidental small group work, virtual worlds being used for immersive role play and simulation tasks, and web conferencing being used with larger cohorts of students for a great variety of pedagogical purposes. Interestingly, 39% of respondents indicated that they had used rich-media synchronous technologies to unite remote and face-to-face students.

Over 600 respondents to the scoping study accepted an invitation to join the Blended Synchronous Learning Collaborator Network. In order to develop the Collaborator Network and share developments in blended synchronous learning a series of four workshops were held throughout the project with an average of approximately 30 people in each.

The Blended Synchronous Learning Scoping Study was also used to identify case study partners. Seven case studies of blended synchronous learning were conducted in Higher Education institutions across Australia. These encompassed a wide variety of technologies, discipline areas and learning designs, including:

1. web conferencing to develop investment understanding using a collaborative evaluation task;
2. room-based video conferencing to develop understanding of healthcare quality improvement approaches using an interactive lecture and collaborative evaluation task;
3. web conferencing to develop microscopic tissue analysis and interpretation skills using group questioning tasks;
4. web conferencing for participation in statistics tutorials using collaborative problem solving;
5. virtual worlds to facilitate Chinese language learning using a paired role-play;
6. web conferencing to enable presence in sexology using interactive lecture discussions; and
7. virtual worlds for teacher education using collaborative evaluation and design tasks.

The analysis of the case studies was based upon a variety of data sources which included pre-observation teacher-documented case overviews, pre-observation teacher interviews, video and screen recording of the blended synchronous learning lessons, researcher lesson observations, post-observation student survey responses, post-observation student focus groups, and post-observation teacher interviews.

The cross case study analysis provided an overarching view of student and teacher perceptions of blended synchronous learning. Many remote students indicated blended synchronous learning offered fast access to learning support and increased their sense of connectedness. Many face-to-face students appreciated being exposed to a broader range of perspectives. Both remote and face-to-face students valued the flexibility that blended synchronous learning afforded, and in many cases felt that it led to an enhanced sense of community. Responses to the lesson evaluation questionnaires across the seven case studies indicated that 74% of face-to-face and 77% of remote students would like blended synchronous learning to be used in other subjects that they studied. Technology reliability and performance was seen as an issue for some remote and face-to-face students and comments from some face-to-face students suggested that the involvement of remote students could at times slow down the lesson or interfere with face-to-face students' interaction opportunities. Teachers also recognised several advantages to blended synchronous learning, such as the ability to include remote students in classes, field more questions during lessons, and increase the active learning of all students. However, teaching in blended synchronous learning mode placed high demands on teachers in terms of cognitive load. Technology performance issues and preserving the quality of the face-to-face experience were also seen as issues.

The Blended Synchronous Learning Handbook is the main output of this project. It includes a Blended Synchronous Learning Design Framework that offers pedagogical, technological and logistical recommendations for teachers attempting to design and implement blended synchronous learning lessons (see Chapter 14). The Handbook also includes a Rich-Media Synchronous Technology Capabilities Framework to support the selection of technologies for different types of learning activities (see Chapter 4), as well as a review of relevant literature, a summary of the Blended Synchronous Learning Scoping Study results, detailed reports of each of the seven case studies, the cross case analysis, and recommendations for institutions.

Seven Blended Synchronous Learning workshops were held in capital cities across Australia in order to disseminate the findings and amplify the impact of the project. The workshops were run in blended synchronous learning mode, and were attended by 268 participants from over 40 Higher Education institutions. Of the 169 participants who provided workshop evaluation feedback, 93% felt that their workshop was 'good' or 'excellent'.

Another key output of the project is the Blended Synchronous Learning website (available at <http://blendsync.org>). It contains video overviews of the case studies, a link to the Blended Synchronous Learning Collaborator Network, and other information about the project including the personnel, publications, and workshops associated with the initiative. It is envisaged that the website, along with the Blended Synchronous Learning Handbook provide guidance to help educators and universities effectively unite remote and face-to-face students in live classes using contemporary rich-media synchronous technologies.

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Chapter 1 – About the Blended Synchronous Learning Project

Overarching Mission

Twenty-first century university students find it increasingly difficult to commit to regular face-to-face classes, yet real-time interaction and collaboration are often essential to achieving successful learning outcomes. The aim of the Blended Synchronous Learning project was to identify, characterise, and evaluate technology-enhanced ways of bringing together on-campus and geographically dispersed students and engaging them in media-rich synchronous collaborative learning experiences. This project was funded by an Australian Office for Learning and Teaching Innovation and Development Grant entitled “Blended synchronicity: uniting on-campus and distributed learners through media-rich real-time collaboration tools” (ID11-1931).

Under the project specification a base of innovative practices in the use of three such technologies – desktop video-conferencing, web-conferencing, 3D virtual worlds – was to be compiled, and in conjunction with a capability analysis of the technologies aimed to provide a development of a framework for tool selection and use plus a collection of exemplar learning designs. Working with members of a practitioner network established at the project’s outset, several case studies were conducted to trial and refine blended synchronous learning design practices. Outcomes of the project were to be disseminated through a Handbook, a webinar series and nationwide workshops.

Project Rationale

Research clearly indicates that Australian university students are coming on to university campuses less and are going online more to fulfil their learning needs (James, Krause, & Jennings, 2010; Gosper, Green, McNeill, Phillips, Preston, & Woo, 2008). As they increasingly need to juggle the competing demands of work, family and study, the ways in which they engage with higher education institutions is changing. The use of technology is playing a key role in this change. While most students still enrol to study on a centralised campus, their studies are supported through a range of online resources – lecture recordings, notes, readings, and so on – that make coming to campus more optional. As students choose more flexible study options and technology-based learning support becomes pervasive at universities, the boundary between traditional campus-based and distance learning in higher education is becoming blurred (Dillenbourg, 2008).

Given the changing patterns of student engagement in higher education, the tertiary sector is more actively considering how technology can facilitate collaborative interactions between staff and students who are increasingly distributed and dislocated (Herrington, Herrington, Ferry, & Olney, 2008; Lowe, Murray, Li, & Lindsay, 2008; Smyth, Andrews, & Tynan, 2008). University educators recognise that in many disciplines, collaborative activities often lie at the heart of engaging and effective learning experiences. These collaborative interactions take a variety of forms and may include an individual student and

tutor participating in a deep discussion about a tricky concept, pairs or small groups of student peers discussing problems or topics, whole-class discussions including facilitated question-and-answer sessions, or tutorial 'papers' or presentations delivered by students in front of their peers.

While enterprise Learning Management Systems have some ability to support collaborative learning activities, such systems are more routinely used for and suited to the provision of resources and asynchronous communication via tools such as discussion forums (Kennedy, 2010; Valcke, 2004). But a range of media-rich synchronous technologies has recently emerged that could be used to greatly enhance the educational experiences of university students who are increasingly distributed. ***This project aimed to investigate how three of these technologies – video-conferencing, web-conferencing and 3D virtual worlds – can be best used to support effective collaborative activities that engage higher education students and teachers in real-time learning irrespective of their location.***

Overview of the Blended Synchronous Learning Project Phases

The Blended Synchronous Learning Project ran from October 2011 to February 2014 and consisted of four phases. During Phase 1 the team performed a scoping study of how universities were teaching with rich-media synchronous technologies, which included an extensive review of the literature and also a survey of over 1700 educators from across Australia and New Zealand. From the survey respondents over 600 nominated to be part of the Blended Synchronous Learning Collaborator Network, and throughout the Project this number grew to nearly seven hundred members. During Phase 2 six case study partners were selected from respondents to the survey, and case study instruments and protocols were established. The Phase 3 case studies were conducted between July 2012 and August 2013, and consisted of observations and the analysis of seven blended synchronous learning contexts in universities across Australia. The final dissemination phase (Phase 4) took place from September 2013 to March 2014, and involved several blended synchronous learning workshops in capital cities around Australia as well as finalisation of the Blended Synchronous Learning website <blendsync.org>.

Outputs of the Blended Synchronous Learning Project

Based on the phases above, the outputs of the project were:

1. The **Blended Synchronous Learning Scoping Study** which provided an overview of how rich-media synchronous technologies were being used by tertiary educators in Australia and New Zealand.
2. The formation of the **Blended Synchronous Learning Collaborator Network** involving over six-hundred educators from across Australia and around the world, many of whom participated in the **Blended Synchronous Learning Webinars**.
3. A set of **case studies and a cross-case evaluation** that provides details of each case study's learning, teaching and assessment scenario including the design of the collaborative learning activities, the technology implementation and integration, as well as the evaluation approach, findings, and lessons learnt.

4. The **Blended Synchronous Learning Handbook** that contains:
 - a) a review of literature relevant to blended synchronous learning;
 - b) results from the Blended Synchronous Learning Scoping Study;
 - c) a Rich-Media Synchronous Technology Capabilities Framework that supports selection of video-conferencing, web-conferencing and 3D virtual world technologies based on their affordances (both generally and for particular products);
 - d) the case studies and cross case analysis; and
 - e) a Blended Synchronous Learning Design Framework that provides practical recommendations for educators based on the findings from the blended synchronous learning case studies.
5. A series of **Blended Synchronous Learning workshops** in capital cities across Australia, to be run by the project team members in collaboration with the case study partners and other members of the practitioner network.
6. The **Blended Synchronous Learning project website** that provides an overview of the case studies (including video summaries), links to publications and resources, a portal for the Collaborator Network, and an enduring record of the project after its completion.

Each of these outputs are described in detail in the following chapters. Note that this Final Report should be read in conjunction with the Blended Synchronous Learning Handbook, available at <http://blendsync.org/handbook>. The Handbook is the definitive source of results and primary outlet for reporting for this project – it is the evidential guide that explains to educators the key pedagogical, technological and logistical issues associated with blended synchronous learning. In order to avoid unnecessary and potentially confusing repetition of content, readers will be in most cases referred from this Final Report to the Handbook for details of results.

Chapter 2 – The Blended Synchronous Learning Scoping Study

An initial component of the Blended Synchronous Learning Project was a benchmarking review of how the Australian and New Zealand tertiary sectors had previously and were currently using blended synchronous learning. A questionnaire was developed for this purpose which contained three substantive sections: a section on general demographic and teaching questions, a section about rich-media synchronous tool usage, and a section on whether/how media-rich real-time collaboration tools were being used to synchronously unite face-to-face and remote students (the Blended Synchronous Learning Scoping Study survey instrument is provided in Appendix A). Participants were also asked to provide their perceptions of the best reasons to use video conferencing, web conferencing and virtual worlds. Only a subset of the findings will be reported in this Final Report due to space limitations. Interested readers should consult Bower et al. (2012) for further details and results. The results in this chapter are also presented in the Blended Synchronous Learning Handbook.

The Blended Synchronous Learning Scoping Study survey was advertised via national and international educational technology mailing lists (e.g. ascilite, HERDSA, ODLAA, DEANZ, ACODE, EDUCAUSE, ITForum) and through personal contact of members of the project team. The survey was opened from the beginning of December 2011 to the end of February 2012. Of the 1748 survey responses received, 750 were complete responses from employees of Australian and New Zealand Universities and were sufficiently complete to use in the analysis. Slightly more females than males responded (females: 54.2%; males: 45.8%), and the mean age of respondents was approximately 48 years old. Responses were received from 38 of the 39 Australian universities and all 8 of the New Zealand universities.

Figure 1 shows the years in which respondents had used desktop-video conferencing, room-based video conferencing, web conferencing and virtual worlds in their teaching since the year 2000. The graph shown in Figure 1 clearly indicates that the usage of rich-media real-time collaboration tools in the classroom has increased significantly since 2000, but more interesting is the relative use of each type of tool. Room-based video conferencing was the dominant technology for rich-media real-time communication in 2000, and maintained this position at least until 2003. From 2004 to 2008 there was, broadly speaking, comparable use of room-based video conferencing, web conferencing and desktop conferencing. From 2009 to 2010, web conferencing and desktop video conferencing tools were used by more respondents than room-based video conferencing, and the usage of these tools approximately doubled between 2008 and 2010. Moreover, while all four technologies have seen progressive growth in their user base, virtual worlds do not enjoy the penetration of the other three technologies, and even show a slight decrease in usage from 2010 to 2011. This may in part be explained by the existence of a number of barriers to usage and institutional support issues associated with virtual worlds (Dalgarno, Lee, Carlson, Gregory, & Tynan, 2011b) as compared to web conferencing in particular, which tends to be institutionally supported.

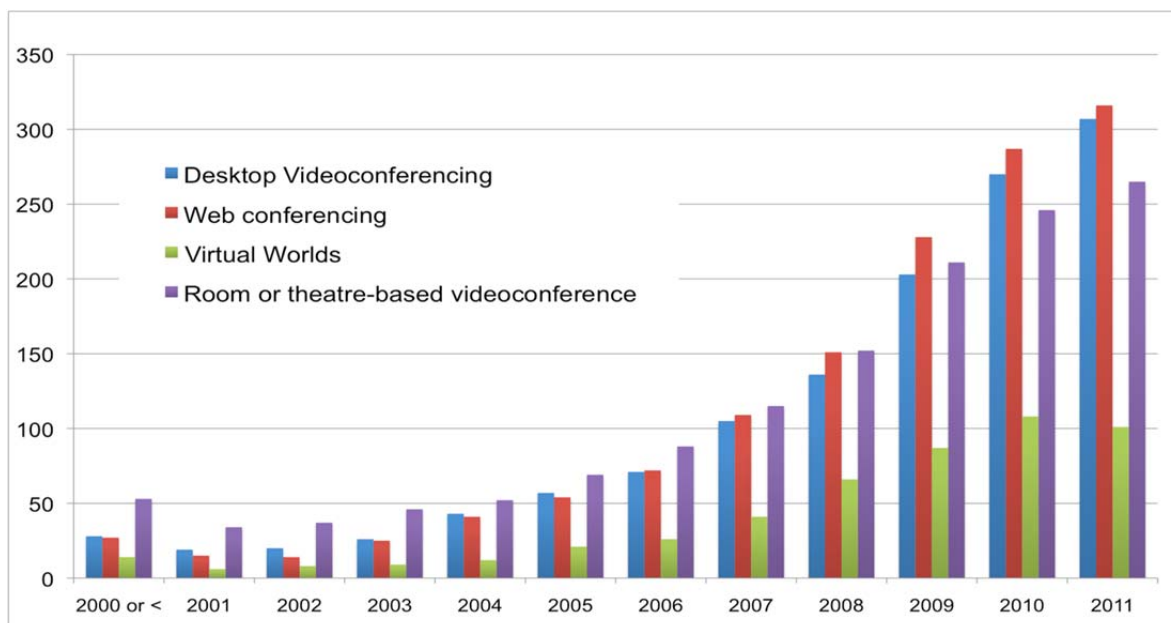


Figure 1: Use of rich-media real-time collaboration tools by year

Figure 2 shows the percentage of respondents in the sample who used specific web conferencing products. It can be seen that four tools in the web conferencing category enjoyed especially healthy patronage: *Elluminate* (30.9%), *Blackboard Collaborate* (30.6%), *Wimba* (20.8%) and *Adobe Connect* (20.5%). It is noteworthy that *Elluminate* was acquired by Blackboard, Inc. in 2010 and was rebadged as *Blackboard Collaborate*. It is therefore likely that some respondents would have used *Elluminate* but not *Blackboard Collaborate*, some would have switched from *Elluminate* to *Blackboard Collaborate*, and others would have adopted *Blackboard Collaborate* without having previously used *Elluminate*. A consequence of this is that collectively, the proportion of people using either *Elluminate* or *Blackboard Collaborate* may well be substantially larger than 30%. Additionally, *Wimba* has been taken over by Blackboard, and although at the time of the survey it continued to be supported as a separate product (Wimba Inc., 2010), its long term future appears uncertain.

Figure 3 displays the percentage of respondents using each of the products in the desktop video conferencing category. Clearly *Skype* is the most popular tool, with 59.1% of respondents indicating they had used this tool in their teaching, which is double the number of users of the most popular web conferencing tool. *Windows Live Messenger* (16.0%), *Google Voice and Video Chat* (12.5%) and *Yahoo! Messenger* (9.8%) enjoyed moderate use. With the recent emergence of the popular *Google Plus* collaborative platform it is likely that these percentages will have changed considerably since the survey was implemented.

The proportion of respondents using different virtual world platforms is depicted in Figure 4. It shows that use of virtual worlds is low compared to the other rich-media real-time collaboration tools. *Second Life* is the only tool with a significant user base, and even then it represents only 14.9% of the sample. Interest in *OpenSim* has grown in recent years, and a number of third-party grid providers have emerged (Dalgarno, Lee, Carlson, Gregory, & Tynan, 2011a). Commentary from the Australian Virtual Worlds Working Group supports this claim, and it may be anticipated that people will increasingly choose these alternate platforms to *Second Life* in the coming years.

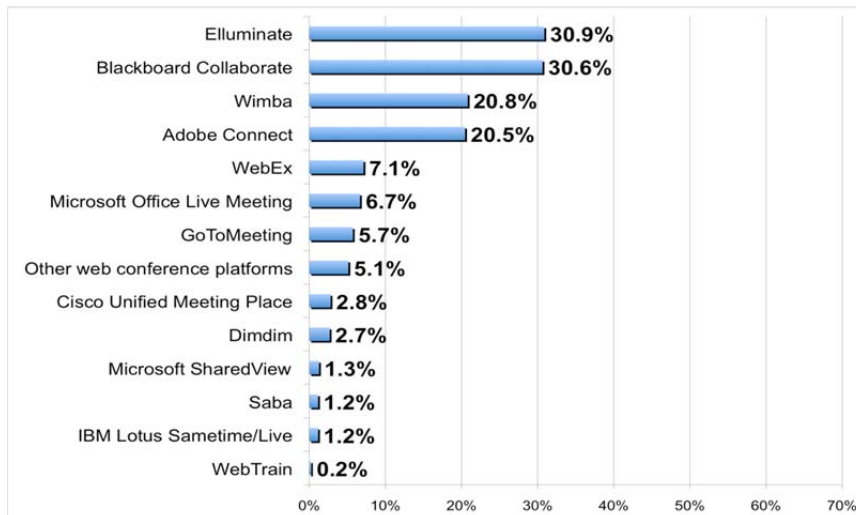


Figure 2: Percentage of respondents using a range of web conferencing tools

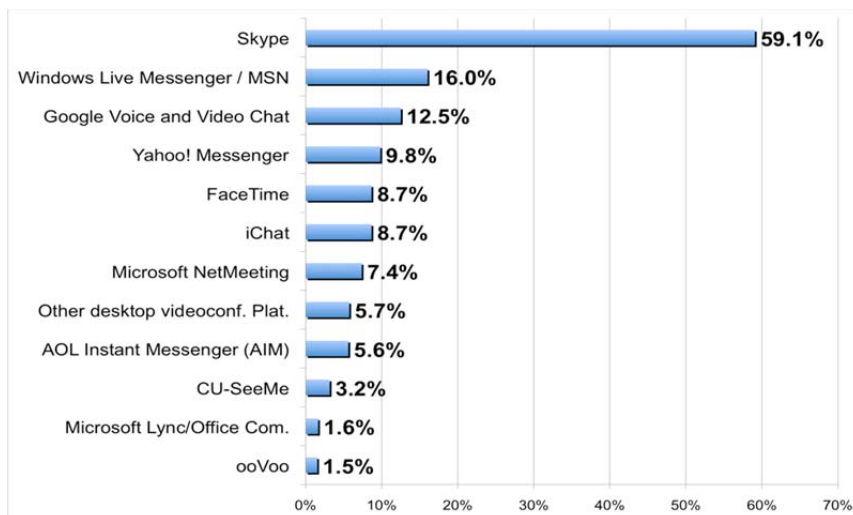


Figure 3: Percentage of respondents using a range of desktop video conferencing tools

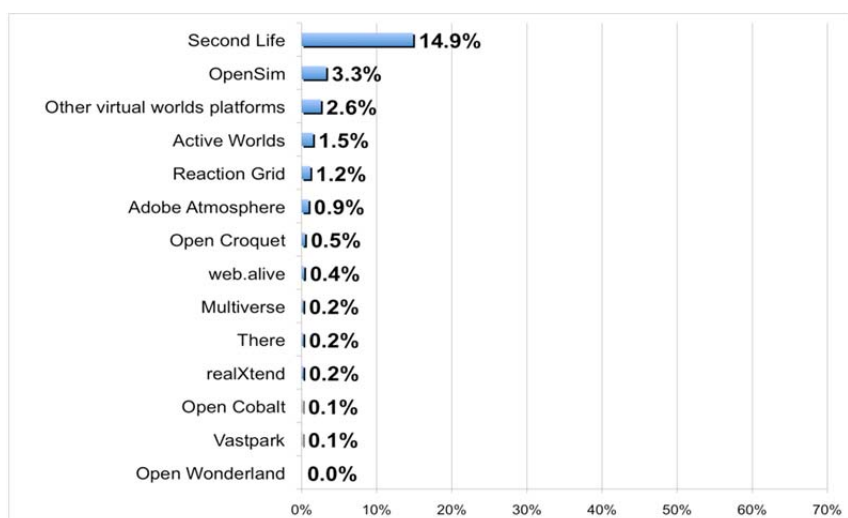


Figure 4: Percentage of respondents using a range of virtual world platforms

The reflections of respondents with a broad range of experience teaching with rich-media real-time collaboration tools were analysed to examine the perceived best uses of video conferencing, web conferencing and virtual worlds. Responses indicated that desktop video conferencing is generally most suitable for small-group and often informal sessions where audio and video are the modes of communication required. According to respondents, web conferencing has the potential to cater to a larger audience and enables more advanced modes of sharing (presentation slides, voting, drawing on a shared whiteboard, and use of breakout rooms for small-group discussion), but needs greater levels of facilitator skill and preparation. Virtual worlds were essentially seen by respondents as useful simulation environments, which are able to overcome real-world logistics and to facilitate a more situated or contextualised and immersive learning experience. Desktop video conferencing was seen as easier to use than web conferencing, which in turn was seen as having a lower technical overhead than virtual worlds.

Finally, it is interesting to note that of the 750 respondents to the survey, 294 (39.2%) indicated that they had used rich-media real-time collaboration tools to simultaneously involve face-to-face and remotely located students in learning and teaching activities. While it is possible that some of these respondents had misinterpreted the question as relating to purely online synchronous learning and teaching, the result appears to indicate that blended synchronous learning is a prevalent phenomenon in the contemporary tertiary education context.

The survey responses were used to support the selection of case study partners and form the Blended Synchronous Learning Collaborator Network. As mentioned, for more information about the Blended Synchronous Learning Scoping Study refer to Bower et al. (2012).

Chapter 3 – The Blended Synchronous Learning Collaborator Network

As part of the Blended Synchronous Learning Scoping Study survey respondents could indicate whether or not they would like to be a part of the Blended Synchronous Learning Collaborator Network. Of the 1748 survey respondents 616 indicated that they would like to be a part of the Collaborator Network. Throughout the project additional people requested to be included in the Collaborator Network or subscribed to it via the Blended Synchronous Learning website, taking the total membership at the end of the project to 676 people.

The Blended Synchronous Learning Collaborator Network mailing list was used as a means for the project team to disseminate information regarding upcoming events. A key way that members of the Collaborator Network became involved with the project was through the Blended Synchronous Learning webinar series. A summary of the webinars is provided in Table 1 below.

Table 1: Blended Synchronous Learning webinars

#	Title	Date	Content	Participants
1	Blended Synchronous Learning Inaugural Webinar	3/4/12	Project outline, preliminary scoping survey results, discussion of member experiences with blended synchronous learning, soliciting member feedback about evaluation approaches	54
2	Blended Synchronous Learning Webinar II	3/4/13	Member presentation of their blended synchronous learning practices, project update on the case studies and technology capability framework, soliciting member ideas about approaches to technology selection & use	15
3	Blended Synchronous Learning – Experiences from the Virtual Field	25/7/13	Presentation by a case-study partner and an International Advisory Group member, Blended Synchronous Learning project update, member discussion of latest experiences and findings	28
4	Blended Synchronous Learning – The Final Phase	6/12/13	Reflection upon on the outcomes of the project, call for leaders to help sustain the community, and consider how to best progress blended synchronous learning in the future	15

Participants were from a wide range of institutions, with rarely more than two people from the same institution attending any one webinar. On occasions international guests joined with webinars, mainly from New Zealand, but a notable exception was a guest presentation by Valarie Irvine from the University of Calgary. Feedback from participants about the webinars was almost invariably positive. Formal evaluation instruments were not used to

evaluate the webinars as this was seen as potentially interfering with the community building nature of the sessions (note that the Blended Synchronous Learning dissemination workshops were formally evaluated, as outlined in Chapter 6).

In the final webinar Blended Synchronous Learning Collaborator Network volunteers stepped forward to run future webinars so as to sustain the community beyond the life of the project. These webinars are currently being planned.

The Blended Synchronous Learning Project also has a LinkedIn page (ref. <http://www.linkedin.com/groups/Blended-Synchronous-Learning-6641462>) and a Facebook page (ref. <https://www.facebook.com/groups/507493236026576/>) in order to maintain and develop the Blended Synchronous Learning Collaborator Network.

Chapter 4 – The Blended Synchronous Learning Case Studies

Case Study Methodology

The Blended Synchronous Learning case study partners were selected from 1,748 responses to the questionnaire that was used in the Blended Sync Scoping Study. Criteria for selection of case study partners included:

- whether they were synchronously uniting face-to-face and remote students using rich-media technologies;
- the extent to which the case involved high-quality pedagogical practices; and
- the maturity of the design in terms of number of implementations.

Cases were also selected so as to represent a range of technologies and discipline areas. Discussions were held with potential case study partners to determine appropriateness for inclusion in the project and willingness to participate. This resulted in the selection of seven case study partners as summarised in Table 2.

Table 2: Summary of the seven Blended Synchronous Learning cases

Case Study #	Description	Teacher/s	Observation Date
Case Study 1	Web conferencing to develop investment understanding (collaborative evaluation task)	James McCulloch, Tim Kyng, Hong Xie, David Pitt, Macquarie University	23/8/12
Case Study 2	Room-based video conferencing to develop understanding of healthcare quality improvement approaches (collaborative evaluation task)	Joanne Curry, University of Western Sydney	29/9/12
Case Study 3	Web conferencing to develop microscopic tissue analysis and interpretation skills (group questioning)	Lucy Webster, Charles Sturt University	02/4/13
Case Study 4	Web conferencing for participation in statistics tutorials (collaborative problem solving)	Nicola Jayne, Southern Cross University	11/4/13
Case Study 5	Virtual worlds to facilitate Chinese language learning (paired role-play)	Scott Grant, Monash University	23/5/13
Case Study 6	Web conferencing to enable presence in sexology (lecture discussions)	P. J. Matt Tilley, Curtin University	22/8/13
Case Study 7	Virtual worlds for teacher education (collaborative evaluation and design)	Matt Bower, Macquarie University	9/5/13

Prior to case study observations, the project team worked with case study partners to reflect upon and in some cases refine the pedagogical and technological aspects of the blended synchronous learning designs. However, it is important to note that the extent to which designs were adjusted was always at the discretion of the case study partners.

The project adopted a collective case study methodology, using standard case study data collection and analysis approaches as outlined by Yin (2009). Several sources of data were relied upon for each case study, including:

- a pre-observation teacher-documented overview of the case, as it had been implemented in the past;
- pre-observation teacher interviews in order to determine the rationale for the learning design of the case, as well as teachers' insights into the blended synchronous learning approach;
- video and screen recordings of the blended synchronous learning lessons;
- researcher observations of the lessons (both in class and in the online environment);
- post-observation student survey responses;
- post-observation student focus group interviews; and
- post-observation teacher interviews.

The summary of each of the designs was primarily derived from the pre-observation teacher-documented overviews, but also the researcher observations of the lessons as well as the video and screen recordings of the blended synchronous learning lessons. Similarly, the lesson as enacted was based upon researcher observations and video and screen recordings. Student perceptions were determined by synthesising the student questionnaire and focus group interview responses. The student questionnaire was answered anonymously and included 30 items relating to students' ability to interact and share resources, as well as their general perceptions of the lesson and their sense of co-presence (the post-lesson student survey instrument is provided in Appendix B). The semi-structured focus groups provided students with the opportunity to discuss general strategies used in the lesson and to elaborate on their questionnaire responses. Teacher perceptions were distilled from the pre- and post-observation teacher interviews.

Multiple sources of data were analysed and cross-checked by the team in order to establish that accurate data were being collected within the study. For example, the student questionnaire, student focus group transcripts, and teacher interviews were all compared to confirm there was consistency between the concepts of interest and the constructs being addressed in responses by participants. Multiple sources of data were used to triangulate results within cases, and repeated observation of primary outcomes noted across the multiple cases. This triangulation also involved having multiple project team members reviewing and interpreting data, which in turn contributed to the validity and reliability of findings. The project team established a well-structured project database containing multiple sources of data (all case study interview transcripts, transcripts of the lessons, video footage of lessons and all student survey data), which was used to establish a 'chain of evidence' from the claims made in the investigation back to their evidential sources. The reporting of findings relies heavily on primary data (for instance, student and teacher quotes, survey responses from all students, photos and video footage from lessons). These rich, thick descriptions have been used in part to avoid researcher bias from influencing reporting and also to allow readers to assess the extent to which results may be transferable to their own institutions and educational contexts.

Selected images from some of the case studies are shown in Figure 5.

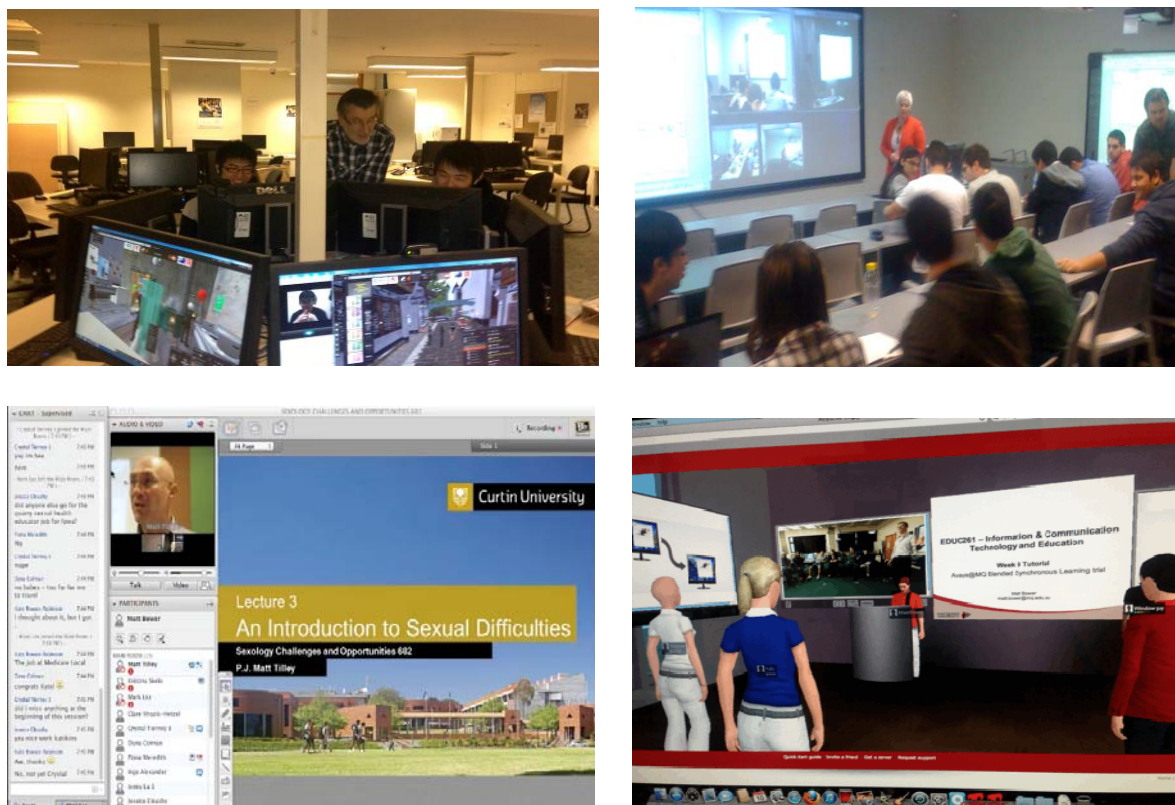


Figure 5: Images from the case studies including (clockwise from top left) the face-to-face student view in Case 5, the face-to-face student view in Case 2, the remote student view in Case 6, and the remote student view in Case 7.

Reporting of the Case Studies in the Handbook

The case study chapters in the Handbook provide a detailed description and analysis of the seven cases of blended synchronous learning that were conducted as part of the project. In order to assist with the description of and comparison across the cases, a common format was established for the reporting of cases. The first part of each case study report describes the blended synchronous learning design that was adopted in the case. The elements of the learning design descriptions along with the rationale for including each element are outlined in Table 3.

While including critical pedagogical dimensions, the descriptive method presented in Table 3 also places particular emphasis on the technology and environment setup and configuration, as these tended to be quite complex for blended synchronous learning environments. The blended synchronous learning design descriptions also emphasise the influence of context on the design and implementation process, not only by including an 'Institutional Context' section, but also through descriptions of the support required for staff and students, and the input of the project team. The technology and environment setup/configuration, resources, support for staff and students, assessment and project team's input into the learning design have all been included in a 'Presage Factors' section as

elements that contributed to implementation of the lesson before the event.

Table 3: Elements of the Blended Synchronous Learning Design descriptions

Learning Design Descriptive Element	Rationale for inclusion
Brief overview	Provide an overall picture of the case to anchor more detailed reasoning
Institutional context (institution, teachers, project team members involved, discipline, subject, level of study)	Provides specific information about the case that foreground observations and may influence results
Intended learning outcome(s)	Establishes the learning outcomes that were intended to be supported by the learning design
Description of the learning activity/tasks (learning design as intended)	Explains the tasks that were designed to achieve the learning outcomes
Technology and environment setup/configuration	Explains how the technology was designed to facilitate blended synchronous learning
Resources	Explains the resources that were used to assist learning and teaching processes
Support for staff	Details ways in which staff were supported in order to manage the blended synchronous learning design and implementation processes
Support for students	Explains how students were supported before, during and after the lessons
Assessment	Establishes how the learning design may have been related to student assessment tasks
Project team's input into the learning design	Explains the extent to which the project team worked with teachers to refine the design prior to lesson observation.

The second part of each case study focuses on the lesson as enacted; describing the lesson as it actually transpired. In essence this relates to the 'process' of implementing the learning design and it is from this section that many of the process factors for Blended Synchronous Learning Designs have been derived.

The third part of each case study reports on perceptions, analysis and interpretation of the lesson, including student perceptions, teacher perceptions, and a discussion section that incorporates project team observations. A summary of findings is provided at the end of each case study chapter in the Handbook to distil the key points of learning from each case study.

Cross Case Analysis

Analysing the blended synchronous learning cases in synthesis led to several emergent themes, as well as an understanding of how different approaches could lead to different outcomes. Student perceptions of blended synchronous learning as well as their views on technological competencies and how to teach well in such environments provide teachers with an understanding of blended synchronous learning issues and potentials. Student, teacher and researcher observations on how to best set up the technology, its affordances and limitations provide a basis for strategic use of rich media communication technologies in blended synchronous learning mode. Teacher perceptions on how to design and implement blended synchronous learning lessons offers fellow educators advice for attempting or enhancing blended synchronous learning and teaching. Observations on cognitive load and presence have been separated so that teachers teaching in blended synchronous learning mode can understand the key issues and adopt according strategies. Finally, reflections about how to best support blended synchronous learning have been distilled to provide recommendations for institutions.

There was an assortment of reasons that many students valued blended synchronous learning. Remote students found it offered them faster access to support and increased their sense of connectedness. Many face-to-face students appreciated being exposed to a broader range of perspectives. Both remote and face-to-face students valued the flexibility that blended synchronous learning afforded, and in many cases felt that it led to an enhanced sense of community. The ability to hold extended discussions and to mutually support one another, as well as having all of the information in one space, were seen as advantages of blended synchronous learning. The technology enabled students to engage in a wider range of activities than would otherwise have been possible, including group writing tasks, diagram labelling exercises, voting activities and role plays. In some cases both remote and face-to-face students reported learning more in blended synchronous learning mode than in their usual classes because of the active learning tasks that the teacher designed and applied. Responses to the lesson evaluation questionnaires across the seven case studies indicated that 74% of face-to-face and 77% of remote students would like blended synchronous learning to be used in other subjects that they studied. Technology reliability and performance was seen as an issue for some remote and face-to-face students and comments from some face-to-face students suggested that the involvement of remote students could at times slow down the lesson or interfere with face-to-face students' interaction opportunities.

Teachers also recognised that there were several advantages to blended synchronous learning, such as the ability to include remote students in classes, field more questions during lessons, and increase the active learning of all students. The technology was seen as a way to facilitate greater contribution by all students, and increase the sense of community amongst the class. However, teaching in blended synchronous learning mode placed high demands on teachers in terms of cognitive load, with the teacher needing to simultaneously manage two cohorts of students, multiple streams of information and the technology, all while teaching the subject matter. Technology performance issues and preserving the quality of the face-to-face experience were also seen as issues when teaching in blended synchronous learning mode.

Blended synchronous learning offers many advantages to institutions. It can provide more flexible access to programs, increase the amount of in-class participation, enhance students' sense of connectedness, and potentially be more financially efficient. However, findings from this study indicate that for blended synchronous learning to be successful, institutions need to provide appropriate technical support, teaching assistance, professional development, and pre-equipped learning and teaching spaces. Additionally, adequate workload allowance needs to be provided to teachers teaching in blended synchronous mode to account for the extra time commitment it requires during preparation.

For further details about the case studies and the cross case analysis please refer to the Blended Synchronous Learning Handbook, available at <http://blendsync.org/handbook>. For video summaries of the individual cases as well as an overall summary video please see <http://blendsync.org/cases>.

Chapter 5 – The Blended Synchronous Learning Handbook

The Blended Synchronous Learning Handbook is the primary output of the Blended Synchronous Learning Project. This chapter describes the structure of the Handbook, but does not describe its contents in order to avoid repetition. This Final Report should be read in conjunction with the Blended Synchronous Learning Handbook. The Blended Synchronous Learning Handbook is available for download from <http://blendsync.org/handbook>.

The first chapter of the Blended Synchronous Learning Handbook provides a general overview of the project and its rationale. It also identifies the relevance of the Handbook for academics, educational design and development staff, IT managers and support staff, as well as institutions, institutional leaders and policy makers. The second chapter provides a review of relevant literature relating to the design and implementation of blended synchronous learning. It is divided into four sections that address collaborative learning in general, findings from previous studies of blended synchronous learning, tools to support blended synchronous learning, and Learning Design frameworks.

Chapter 3 of the Handbook provides an overview of findings from the Blended Synchronous Learning Scoping Study relating to how rich-media synchronous technologies are being used in Higher Education. Based on responses from 750 educators from tertiary institutions it reports on the video conferencing, web-conferencing and virtual worlds tools that are being used as well as people's usage over time. It also provides recommended uses for video-conferencing, web-conferencing and virtual world as reported by respondents who were experienced in the use of media-rich synchronous learning technologies. Readers are referred to Bower, Kennedy, Dalgarno, Lee, Kenney and de Barba (2012) for further details about the methods and results of the scoping study.

Chapter 4 of the Handbook presents a Rich-Media Synchronous Technology Capabilities Framework to support selection of technologies and products that align with the learning goals and activities. In particular, the framework provides guidance about how particular learning and teaching activities (such as presenting slides, co-creating a typed text, and collaborating in a 3D space) can be supported by desktop video-conferencing, web-conferencing and virtual worlds. The Framework also provides a tabulation of the extent to which the learning and teaching activities two most popular products in each class of rich-media synchronous learning technology (as determined by the Blended Synchronous Learning Scoping Study).

After providing a brief overview of the case study methodology and approach to reporting in Chapter 5 of the Handbook, Chapter 6 to Chapter 12 provide detailed reports of each of the seven Blended Synchronous Learning Case Studies. As previously explained the reporting is divided into presage (contextual) factors, an outline of the learning design as intended, a description of the lesson as enacted, followed by a summary of student perceptions, teacher perceptions, a discussion of the case and a summary of key findings.

Chapter 13 presents the cross case analysis, focusing on student and teacher perceptions of

blended synchronous learning (both advantages and disadvantages associated with the approaches). Pedagogical presage and process factors are discussed, including potentials and challenges as well as considerations associated with group work. Sections also address technology setup issues, cognitive load and presence, and the contribution of technological competencies to the success of blended synchronous learning lessons. A quantitative summary of survey responses across cases is also included to provide an overall indication of student perceptions of blended synchronous learning.

The final chapter (Chapter 14) provides recommendations based on the findings of the project, and presents a vision forward for blended synchronous learning. The recommendations are framed in terms of a Blended Synchronous Learning Design Framework, to help educators successfully utilise blended synchronous learning in their classes (see Table 4 below).

Table 4: The Blended Synchronous Learning Design Framework

Presage	<i>Pedagogy</i> <ul style="list-style-type: none"> • Clearly define learning outcomes • Design for active learning • Determine whether to group remote with face-to-face students • Utilise general design principles 	<i>Technology</i> <ul style="list-style-type: none"> • Match technologies to lesson requirements (see MRSTCF in Chapter 4) • Setup and test the technology in advance 	<i>Logistic/setup</i> <ul style="list-style-type: none"> • Be highly organised in advance • Solicit the right institutional support • Prepare students • Prepare self • Establish a learning community
Process	<i>Pedagogy</i> <ul style="list-style-type: none"> • Encourage regular student contribution • Distribute attention between remote and face-to-face students • Identify the focus of learning and discussion • Avoid duplication of explanations • Circulate amongst groups • Draw upon existing pedagogical knowledge • Be flexible, adaptive and composed 	<i>Technology</i> <ul style="list-style-type: none"> • Know how to use (and troubleshoot) the technologies • Appropriately utilise audio-visual modalities • Ensure students have correct permissions • Advise students how to use the technology • Use tablet devices to facilitate visual input if required 	<i>Logistic/setup</i> <ul style="list-style-type: none"> • Start lessons 10 mins early for technology testing • Apply tactics to work with text chat contributions • Login to a second computer (to see student view) • Seek teaching assistance where possible and desirable
Product (Outcomes)	<ul style="list-style-type: none"> • More active learning (remote and face-to-face) • Enhanced sense of community (through co-presence) • More flexible access to learning <p style="text-align: center;">LEADS TO</p> <ul style="list-style-type: none"> • Increased student satisfaction 		

The Blended Synchronous Learning Design Framework articulates pedagogical, technological and logistical strategies to support the design and implementation of blended synchronous learning lessons. The final chapter of the Handbook also provides recommendations for institutions, as well as a commentary of how research and technology development may influence the future of blended synchronous learning.

As previously discussed, for specific details about the findings of the project please refer to the Blended Synchronous Learning Handbook available at <http://blendsync.org/handbook>.

Chapter 6 – The Blended Synchronous Learning Workshops

The Blended Synchronous Learning workshops took place in capital cities across Australia between October 2013 and February 2014. The purpose of the workshops was to disseminate the key findings from the project so as to amplify project impact. A schedule of the workshops is shown in Table 5.

Table 5: Summary of the Blended Synchronous Learning workshops

City	Workshop Details		Attendees		
	Date	Venue	F2F	Remote	Total
Adelaide	Friday 25 th October 2013	University of South Australia, City West Campus, Adelaide	25	25	50
Brisbane	Friday 1 st November 2013	The University of Queensland, St Lucia Campus, Brisbane	24	6	30
Sydney I	Thursday 7 th November 2013	The University of Sydney, Camperdown Campus, Sydney	19	6	25
Hobart	Friday 15 th November 2013	University of Tasmania, Sandy Bay Campus, Hobart	16	19	35
Perth	Friday 22 nd November 2013	Curtin University, Bentley Campus, Perth	31	18	49
Sydney II	Monday 2 nd December 2013	Macquarie University, North Ryde Campus, Sydney	28	2	30
Melbourne	Friday 7 th February 2014	234 Queensberry Street, The University of Melbourne, Carlton	27	22	49
Total			170	98	268

The Blended Synchronous Learning workshops were run in blended synchronous learning mode, meaning that participants could either attend face-to-face or online. As well as providing greater access to the workshops, this enabled the team to model blended synchronous learning practices so that participants could develop an experiential understanding of the subject matter being addressed. The web-conferencing system of each host institution was used to facilitate the blended synchronous learning workshops, meaning that participants from that institution were able to experience how their web-conferencing system operated. Participants were from a wide range of institutions, including 35 Australian Higher Education institutions, 5 New Zealand Higher Education Institutions, and one participant from a United Kingdom university.

The workshops covered the rationale of the project, provided an overview of the case studies (including a video summary), and presented the findings of the cross case analysis. Throughout the workshops a range of strategies were used to engage participants, including the use of polls, text chat discussions, and audio discussions. Both remote and face-to-face participants contributed to discussions, and discussions often diverged from the pre-planned content of the workshop to respond to the questions and ideas of the participants. At the end of the workshop people were provided with the opportunity to use AvayaLive Engage virtual world, so that they could experience how collaborating in a virtual world compared to web-conferencing and reflect upon circumstances under which they might use each type of technology.

A brief feedback survey was distributed to all participants. The survey was based upon the evaluation guidelines in the OLT Working With Workshops guide (available at <http://www.olt.gov.au/system/files/Working%20with%20workshops%200609.pdf>). In particular, the workshop evaluation questionnaire was designed to provide feedback about the overall reaction to the workshop ('Level 1' evaluation), the amount that people learnt ('Level 2' evaluation) and the amount of transfer that people anticipated would take place ('Level 3' evaluation). As well as Likert scale items about each of these aspects of the workshops, people were provided with the opportunity to explain their answers. Participants were also asked whether they attended face-to-face or online. No other questions were included in the survey in order to minimise the feedback burden on attendees. The Blended Synchronous Learning Workshop Feedback Questionnaire is provided in Appendix C.

In total 169 of the 268 attendees agreed to complete the workshop evaluation feedback questionnaire (63%). Of those, 121 indicated that they were face-to-face participants, and 47 indicated that they were remote participants, which was generally representative of the proportion of participants who attended in each mode. Figure 6 shows a graph summarising respondents' overall perceptions of the Blended Synchronous Learning workshops. The graph indicates that 93% of respondents felt the workshops were 'good' or 'excellent'. Reasons that people appreciated the workshops included the real-life practical examples, experiencing blended synchronous learning approaches, the interactivity of the session, the clear presentation of material, and the stimulation of new teaching ideas. Suggestions for improvement mainly related to having more time to go into greater depth and resolution of technical issues (particularly in one workshop).

The amount that respondents felt they learnt is summarised in Figure 7. The graph indicates that 96% of respondents felt they learnt something of substance from the workshop (either 'a bit', 'quite a lot', or 'a large amount'). Based on the open-ended feedback responses to this item the main points of learning included a broad overview of what was happening in the field, pedagogical possibilities as identified in the case studies, seeing how to run blended synchronous learning classes, ways to promote more interaction between remote and face-to-face students, and practical strategies for class management. Respondents indicated that they would have also liked to learn more about the technical details of how to setup a blended synchronous learning class, and more about how the approach could be applied in their specific context.

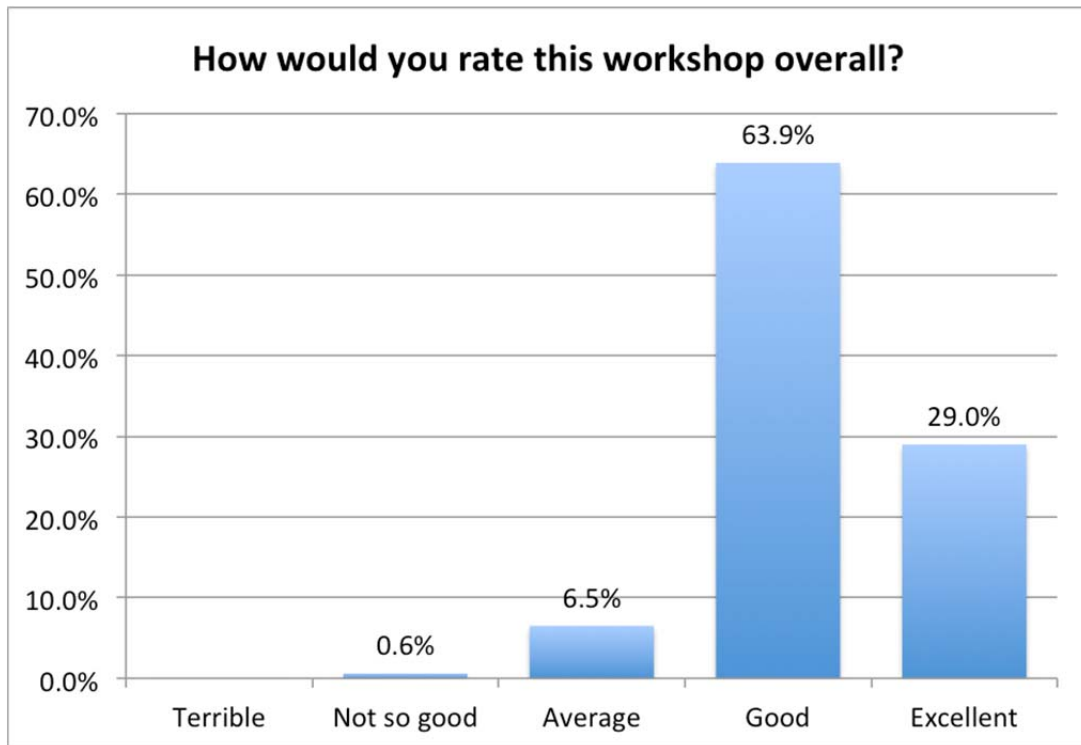


Figure 6: Respondents' overall rating of the Blended Synchronous Learning workshops

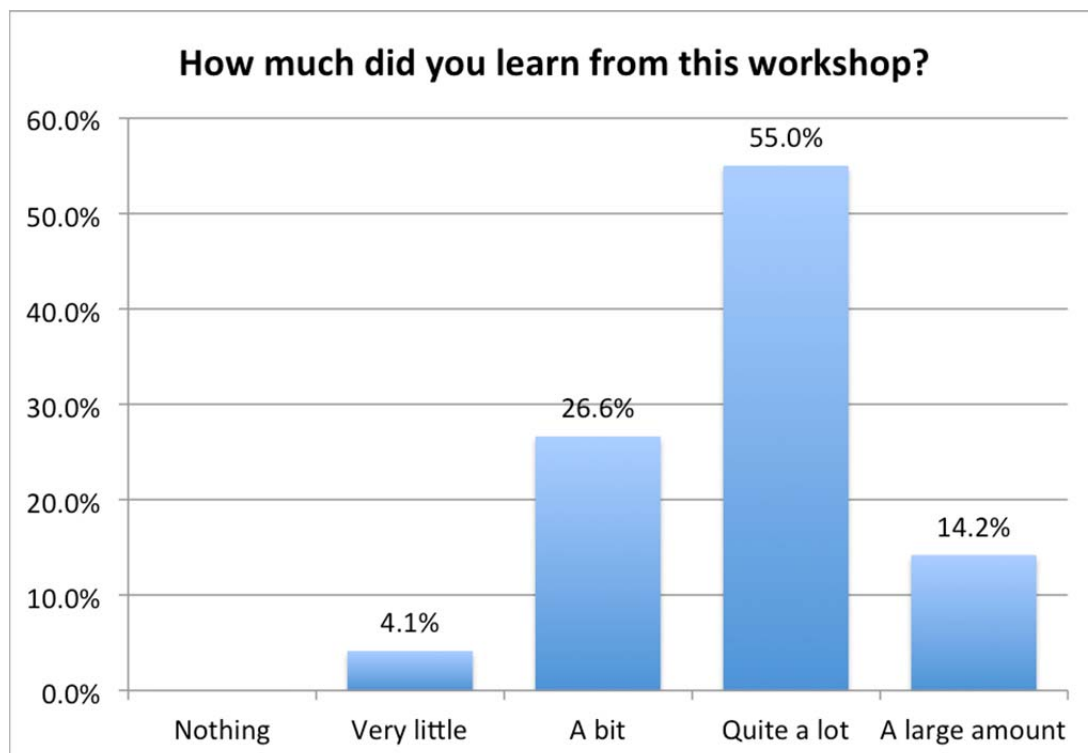


Figure 7: Respondents' rating of how much they learnt from the Blended Synchronous Learning workshops

Figure 8 summarises respondents' perceptions of the likelihood with which they would use what they learnt from the Blended Synchronous Learning Workshops. Over 77% of respondents felt that it was likely they would use what they learnt in the workshop and less than 2% felt that it was unlikely. Respondents felt that they would use the recommendations for teaching and what they learnt about the technologies (both web-conferencing and virtual worlds). Some people unfamiliar with blended synchronous learning felt they mainly learnt about the idea of using the approach. Less than a quarter of the 168 respondents had suggestions about how increase the likelihood they would use what they learnt. These suggestions mainly related to having a copy of the workshop slides and recording (which were sent around to participants after workshops), having greater chance to practice, and knowing who to contact within their institution for support. Several participants mentioned that they were eagerly awaiting the release of the Handbook to help them utilise blended synchronous learning.

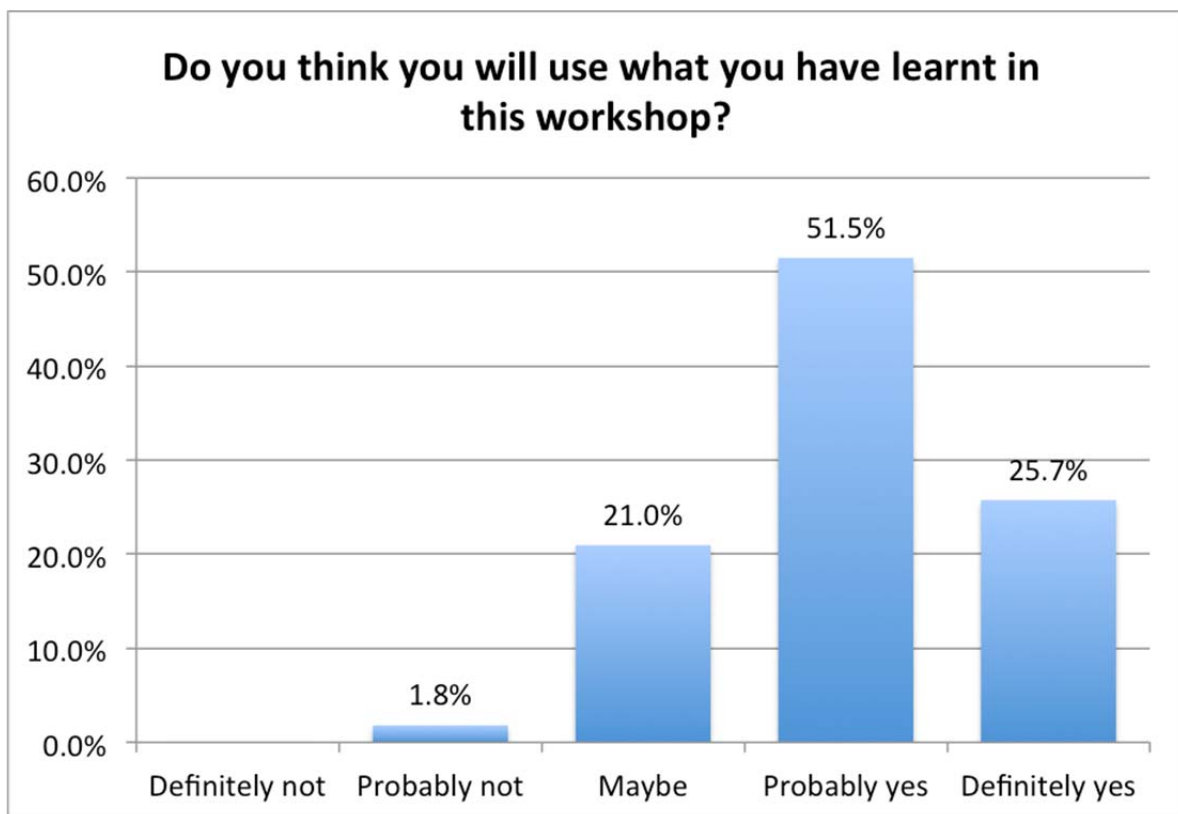


Figure 8: Respondents' perceptions of the likelihood they would use what they learnt from Blended Synchronous Learning workshops

Presentation slides, recordings, and other details about of each of the workshops can be found at <http://blendsync.org/workshops> .

Chapter 7 – The Blended Synchronous Learning Website

The Blended Synchronous Learning website located at <http://blendsync.org> acted as a central portal for all project activity throughout the Blended Synchronous Learning Project. A screenshot of the Blended Synchronous Learning website is shown in Figure 9 below.

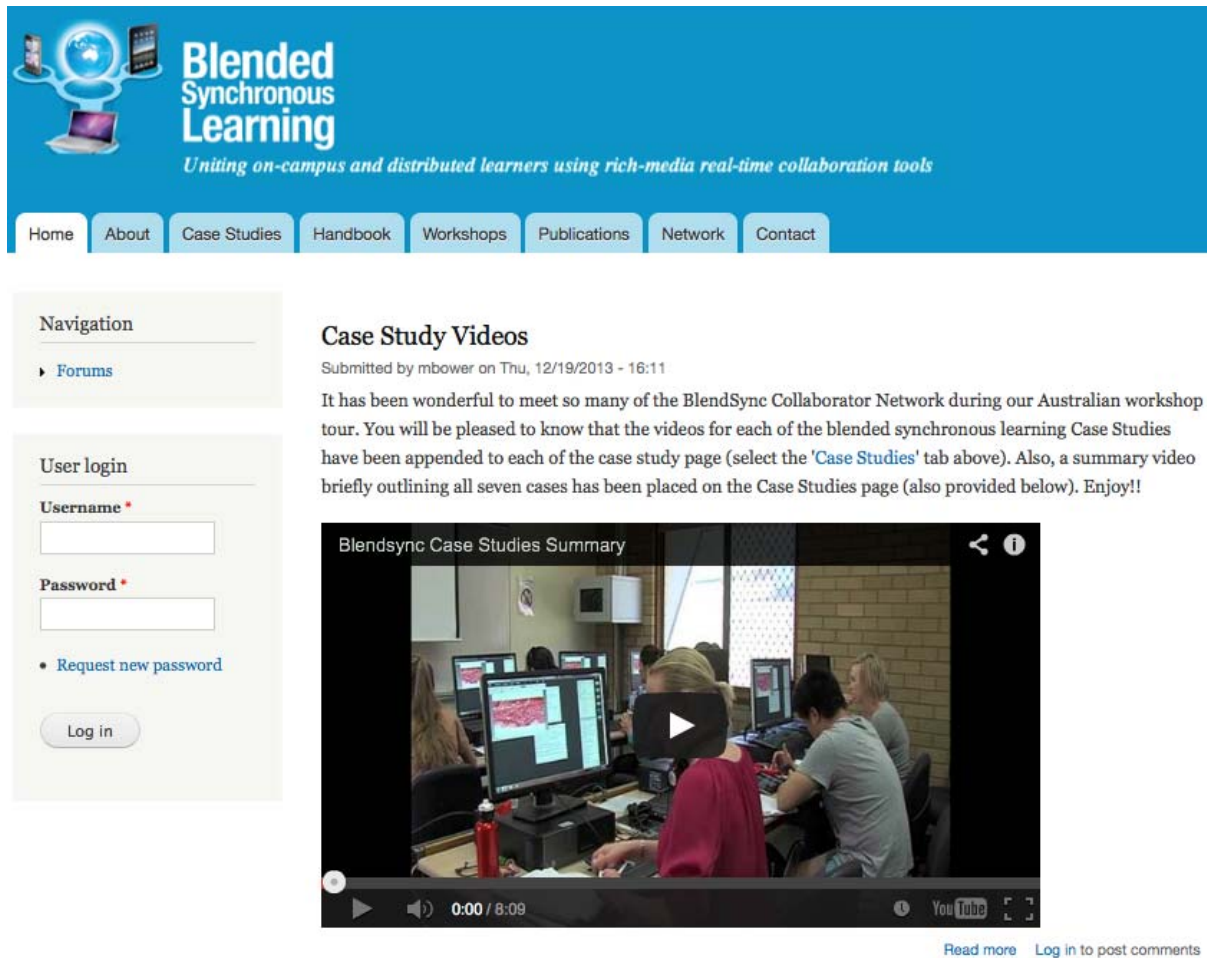


Figure 9: Screenshot of the Blended Synchronous Learning website, available at <http://blendsync.org>

The Blended Synchronous Learning website includes the following pages:

- **Home:** a chronology of the latest project information and updates.
- **About:** an overview of the project, bios of the project partners, and names of the Reference Group and International Advisory Group.
- **Case Studies:** an overview of the case studies (including an overview video) and menu links to specific case study pages including:
 - **Case 1:** Web conferencing to develop investment understanding (collaborative evaluation task);

- **Case 2:** Room-based video conferencing to develop understanding of healthcare quality improvement approaches (collaborative evaluation task);
- **Case 3:** Web conferencing to develop microscopic tissue analysis and interpretation skills (group questioning);
- **Case 4:** Web conferencing for participation in statistics tutorials (collaborative problem solving);
- **Case 5:** Virtual worlds to facilitate Chinese language learning (paired role-play);
- **Case 6:** Web conferencing to enable presence in sexology (lecture discussions); and
- **Case 7:** Virtual worlds for teacher education (collaborative evaluation and design).
- **Handbook:** an outline of the contents of the Blended Synchronous Learning Handbook, as well as a link for the general public to download the Handbook.
- **Workshops:** an overview of the Blended Synchronous Learning dissemination workshops that took place across Australia between October 2013 and February 2014, including links to the workshop recordings.
- **Publications:** a list of publications emanating from the project, as well as presentations (for instance Blended Synchronous Learning webinars) and their associated recordings.
- **Network:** an overview of the Blended Synchronous Collaborator Network as well as a link for people to subscribe to the mailing list, LinkedIn group and Facebook group.
- **Contact:** details about how the general public can contact the Blended Synchronous Learning project team.

Housing all of this information on the website provides educators with ongoing support to implement blended synchronous learning approaches beyond the life of the project. The Blended Synchronous Learning website will be maintained for a minimum of five years from the project completion date, and potentially longer depending on the momentum and initiative of the Collaborator Network.

Chapter 8 – Concluding Comments

Recommendations for Institutions

With the potential to enable more flexible access programs, to improve the quality of learning experience for remote and face-to-face students, and to enhance the sense of connectedness that students feel, blended synchronous learning has a considerable amount to offer institutions. Yet as noted by teachers from across the case studies, teaching in blended synchronous learning mode is challenging.

If institutions are to successfully leverage the potentials of blended synchronous learning they should be cognisant of the following recommendations:

- technical support is imperative for educators teaching in blended synchronous learning mode, particularly during their initial attempts;
- a teaching assistant is often critical to help place students into breakout rooms, alert the teacher about recent student contributions to the text chat, make announcements to both cohorts and so on, especially with large numbers of students;
- professional development and mentoring arrangements are important so that teachers can quickly acquire the capabilities they need to teach in blended synchronous learning mode;
- learning and teaching spaces need to be automated with the appropriate audio-video capture facilities so that teachers can more immediately and seamlessly teach using blended synchronous learning techniques; and
- blended synchronous learning needs to have workload allocated appropriately to account for the extra time that it takes teachers.

Given that teaching in blended synchronous learning mode is more demanding than teaching in either online or face-to-face mode, but there are some economies derived from the common content, recognising blended synchronous learning with a workload of somewhere in between one and two times regular classroom teaching would seem appropriate.

Future Directions

Blended synchronous learning is a new concept to many educators, and it may be a daunting prospect for some. It may be reassuring to know that several of the teachers in the case studies indicated that they initially felt apprehensive about trying to teach in blended synchronous learning mode, yet over time each has developed confidence in using the approach. They saw how blended synchronous learning could transcend the asynchronous offering availed to remote students, and could at the same time enhance the degree of interactivity for face-to-face students. Blended synchronous learning was seen by case study partners as an opportunity to improve their pedagogy, by providing a more participatory and engaging learning environment. While ensuring equity to both cohorts of students was an important consideration, it was seen to be a valuable emerging practice that could lead

to students feeling more “satisfied, engaged and connected” (Case Study 6 teacher). More than one of the case study partners felt the urge to encourage their peers to ‘give it a try’.

Blended synchronous learning raises some big questions for institutions, perhaps in the same way that MOOCs have recently, although with possibly greater long-term impact. The ways in which technology can increase access to education and provide students with greater flexibility of participation has the potential to fundamentally change where and how students chose to learn. And, as always, a range of technologies loom on the horizon that can push and prod our educational thinking. Technologies such as Google Glass (<http://www.google.com/glass/start>), X-Box Kinect (<http://www.xbox.com/en-US/Kinect>) and String (<http://www.poweredbystring.com>) promise much in the area of blended synchronous learning through the use of digital overlays, digital worlds, augmented reality and wearable technologies. In the future groups of dislocated students may be able to collaborate and access three-dimensional resources in high fidelity and real-time, as if they were all in the same room.

In future technological landscapes in which students will have access to near-perfect emulations of real-time face-to-face interaction, educators and institutions are challenged to ask themselves the perennial educational technology questions:

- When is it appropriate to use these technologies?
- What educational purposes are these technologies best suited to?
- How can we support educators to optimise their teaching approaches using these technologies?
- How can we tell if our new teaching and learning approaches are effective?

Closing remarks

This project was borne out of the utopian vision that in the future with advances in Information and Communication Technology all students should have equitable access to face-to-face learning experiences no matter where they are located. Through the outstanding efforts of the case study partners in this project it is apparent that rich-media synchronous technologies such as video conferencing, web conferencing and virtual worlds makes this a possibility in today’s classrooms. As technologies develop, cultures change and expectations rise we should anticipate that the ease of access to and implementation of blended synchronous learning environments will continue to improve.

However, as for any use of technology in education, it is important to not attribute the success of the learning experience to the technology itself. As was apparent in all of the case studies, the teacher and the quality of their pedagogical practices was the main determinant of the student experience. To that extent, teacher practice, development and support should be the primary focus of any blended synchronous learning initiatives. It is intended that this project has provided the evidential basis and guidance to effectively support teachers and institutions in this endeavour.

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Appendix A – Blended Synchronous Learning Scoping Study Questionnaire

[Note that this appendix only includes the Blended Synchronous Learning Scoping Study questions relating to the subject matter being investigated and not the initial information and consent nor the final section relating to dissemination of results.]

Part A: Background Information

This survey is intended to be completed by teaching and educational development staff of Australian and New Zealand Higher Education institutions who have been involved in applications of rich-media real-time collaboration tools.

In this survey, the term 'rich-media real-time collaboration tools' refers to technologies such as desktop videoconferencing, web conferencing and virtual worlds, as well as other technologies that facilitate synchronous (real-time) collaboration.

- Desktop videoconferencing tools enable live audio and video interactions between remote participants via the Internet using desktop programs installed on their computers. Examples of such programs include Skype, ooVoo, iChat and FaceTime.

- Web conferencing tools (sometimes referred to as 'online meeting', 'virtual classroom' or 'webinar' tools) allow groups of users to enter a shared online space where they can use features such as whiteboards, screen sharing, chat, voting, file sharing and collaborative authoring tools together in real time. The tools tend to be web browser-based; examples include Adobe Connect, WebEx, Saba Classroom and Blackboard Collaborate.

- Virtual worlds are online, synthetic representations of physical environments in which users can move around and interact with other objects and users, usually in three dimensions (3D). Examples of virtual world platforms include Second Life, Active Worlds, OpenSim and Open Wonderland.

1. Gender: [Male/Female]

2. Age group: [25 or under/26-35/36-45/46-55/56-65/Over 65]

3. Job title/position:

4. Institution:

5. Campus/location:

6. Faculty/School/Department:

7. What is/are your teaching area(s) (please be specific)?

8. How many years' experience do you have:

- a) Teaching at a tertiary/Higher Education level
- b) Using computers and the Internet for learning and teaching
- c) Using rich-media real-time collaboration tools for tertiary learning and teaching

9. How would you rate your ability to use computers and/or the Internet for learning and teaching:

- a) In general?
- b) With respect to rich-media real-time collaboration tools?

10. Which of the following tools have you used/do you use to facilitate rich-media real-time collaboration in your teaching? (Please select all that apply.)

Second Life	Adobe Connect	Skype
Active Worlds	WebEx	ooVoo
Reaction Grid	Cisco Unified Meeting Place	CU-SeeMe
Multiverse	Wimba	Microsoft NetMeeting
OpenSim	Elluminate	Microsoft Lync / Office Communicator
Open Wonderland	Blackboard Collaborate	Google Voice and Video Chat
Open Cobalt	Dimdim	Windows Live Messenger
Open Croquet	GoToMeeting	AOL Instant Messenger
realXtend	WebTrain	(AIM) Yahoo! Messenger
web.alive	Saba	iChat FaceTime
Vastpark	Microsoft Live Meeting	Other desktop video conferencing platform
There	Microsoft SharedView	(please specify below)
Adobe Atmosphere	IBM Lotus Sametime / Live	
Other virtual worlds platform (please specify below)	Other web conferencing platform (please specify below)	

Room or lecture theatre based video conferencing

Other type of rich-media real-time collaboration tool (please specify below)

If you selected one or more "other" options above, please specify the tool(s) used:

Part B: Views and beliefs about rich-media synchronous technologies for learning and teaching

11. In what situations do you think desktop videoconferencing is best used for learning and teaching?

12. In what situations do you think web conferencing is best used for learning and teaching?

13. In what situations do you think virtual worlds are best used for learning and teaching?

14. Please indicate the various years in which you have used each of the following types of media-rich real-time collaboration tool for tertiary learning and teaching (select all years that apply within each row):

Desktop video conferencing

[2000 or earlier/2001/2002/2003/2004/2005/2006/2007/2008/2009/2010/2011]

Web-conferencing

[2000 or earlier/2001/2002/2003/2004/2005/2006/2007/2008/2009/2010/2011]

Virtual worlds

[2000 or earlier/2001/2002/2003/2004/2005/2006/2007/2008/2009/2010/2011]

15. Have you used rich-media real-time collaboration tools to simultaneously involve face-to-face and remotely located students in learning and teaching activities? [Yes/No]

Part C: Use of rich media collaboration tools for learning and teaching

The following questions ask you to provide information about one subject or unit in which you have used rich-media real-time collaboration tools for learning and teaching.

*** IMPORTANT: If you have used these tools in more than one instance, please describe the case that is most relevant to simultaneously supporting remote and face-to-face students. ***

16. Subject unit/title:

17. Subject unit/level:

18. Discipline area of the subject/unit:

19. Please indicate which years you have made use of rich-media real-time collaboration tools in this subject/unit (select all that apply):

[2000 or earlier/2001/2002/2003/2004/2005/2006/2007/2008/2009/2010/2011]

Please answer the following questions with reference to your most recent offering of this subject/unit.

20. Number of students:

a) enrolled in the subject/unit offering

b) that participated in the rich-media real-time collaboration tool activities

21. Delivery mode (select all that apply):

Conventional face-to-face, supplemented with online materials and/or optional online activities

Conventional face-to-face, blended with mandatory online activities

Distance/online, with face-to-face residential schools or workshops

Distance/online, with no face-to-face contact

Other (please specify):

22. What was the main type of rich-media real-time collaboration tool that you used in this subject/unit?

Please specify the specific technology or tool used.

23. Please provide a summary of the overall aims of the subject/unit.

24. Why did you use rich-media real-time collaboration tools for learning and teaching in this subject/unit?

25. Please describe the learning and teaching tasks/activities in the subject/unit involving the use of rich-media real-time collaboration tools.

26. Did students undertake the rich-media real-time collaboration activities (select all that apply):

[On campus/Off campus/In class time/Out of class time/Using a university computer/Using their own computer]

Please use the space below to explain and expand upon your selection(s). If applicable, elaborate on how students in different locations collaborated in real time:

27. What do you consider to be the most successful aspects of the use of rich-media real-time collaboration tools in this subject/unit?

28. What are the main problems you encountered in the use of rich-media real-time collaboration tools in this subject/unit?

29. Any other comments on the use of rich-media real-time collaboration tools in this subject/unit?

30. Do you use rich-media real-time collaboration tools in any other ways to teach your classes? [Yes/No]

If Yes, please briefly describe each instance.

31. What other emerging approaches can you identify for uniting remote and face-to-face students using synchronous collaborative technologies? Are you motivated to use these approaches in future (please explain why / why not).

Appendix B – Blended Synchronous Learning Post-Lesson Student Survey

[Note that this appendix only includes the Blended Synchronous Learning Post-Lesson Student Survey questions relating to the subject matter being investigated and not the initial information and consent nor the final section relating to dissemination of results.]

Q1. I understand that by choosing to complete the survey I give my consent as a participant in the BlendSync research project: [Yes/No]

Q2. Please select one statement that best describes your attendance mode:

I participated in this lesson remotely (e.g. online or using technology)

I participated in this lesson in the same room as the teacher

Q3. In two or three sentences, please describe your overall impression of this lesson:

Q4. I was able to communicate verbally in an effective manner with people in the face-to-face class:

[Strongly Disagree/Disagree/Mildly Disagree/Neutral/Mildly Agree/Agree/Strongly Agree/Not Required]

Q5. What supported or restricted your verbal communication with the face-to-face class?:

Q6. I was able to communicate verbally in an effective manner with people who participated remotely:

[Strongly Disagree/Disagree/Mildly Disagree/Neutral/Mildly Agree/Agree/Strongly Agree/Not Required]

Q7. What supported or restricted your verbal communication with people participating remotely?:

Q8. In this lesson I was able to effectively share visual artefacts with others (e.g. images, photos, slides, movies):

[Strongly Disagree/Disagree/Mildly Disagree/Neutral/Mildly Agree/Agree/Strongly Agree/Not Required]

Q9. What supported or restricted your ability to effectively share visual artefacts?:

Q10. In this lesson I was able to jointly create, edit, and share material with others in an effective manner:

[Strongly Disagree/Disagree/Mildly Disagree/Neutral/Mildly Agree/Agree/Strongly Agree/Not Required]

Q11. What supported or restricted your ability to joint create, edit and share materials effectively with others?:

Q12. In this lesson I was able to effectively indicate my status to others (e.g. wanting attention, agreeing, unsure, etc.):
[Strongly Disagree/Disagree/Mildly Disagree/Neutral/Mildly Agree/Agree/Strongly Agree/Not Required]

Q13. What supported or restricted your ability to effectively indicate your status to others?:

Q14. In this lesson I felt like I was present with people who were participating remotely:
[Strongly Disagree/Disagree/Mildly Disagree/Neutral/Mildly Agree/Agree/Strongly Agree/Not Required]

Q15. What supported or restricted your sense of being present with people who were participating remotely?:

Q16. In this lesson I felt like I was present with people who were in the same room as the teacher:
[Strongly Disagree/Disagree/Mildly Disagree/Neutral/Mildly Agree/Agree/Strongly Agree/Not Required]

Q17. What supported or restricted your sense of being present with people in the face-to-face classroom?:

Q18. The collaborative technology provided clear and accurate representation of information and people:
[Strongly Disagree/Disagree/Mildly Disagree/Neutral/Mildly Agree/Agree/Strongly Agree/Not Required]

Q19. Explain how the collaborative technology provided or did not provide a clear representation of information and people:

Q20. The technology enabled learning to occur:
[Strongly Disagree/Disagree/Mildly Disagree/Neutral/Mildly Agree/Agree/Strongly Agree/Not Required]

Q21. Explain your answer:

Q22. I learnt _____ in this lesson than if the lesson had run in a normal face-to-face mode: [less/the same/more]

Q23. Explain your answer:

Q24. Were there any issues that arose by having remote and face-to-face students participating in the one lesson? If yes, explain what they were and how they impacted on the learning experience:

Q25. Were there any advantages of having remote and face-to-face students participating in the one lesson? If yes, explain what they were and how they impacted on the learning

experience:

Q26. What advice would you give to people who are trying to simultaneously teach remote and face-to-face students?

Q27. Were there any technical difficulties experienced during this lesson? If yes, please explain:

Q28. I would like this sort of approach to be used in other subjects that I study:
[Strongly Disagree/Disagree/Mildly Disagree/Neutral/Mildly Agree/Agree/Strongly Agree/Not Required]

Q29. Explain your answer:

Q30. What were the best things about this lesson?:

Q31. How could this lesson have been improved?:

Appendix C – Blended Synchronous Learning Workshop Evaluation Questionnaire

Q1 How would you rate this workshop overall?

[Terrible / Not so good / Average / Good / Excellent]

Q2 What were the best things about this workshop

Q3 What improvements could you suggest?

Q4 How much did you learn from this workshop?

[Nothing / Very little / A bit / Quite a lot / A large amount]

Q5 What were the most valuable things you learnt?

Q6 What didn't you learn that you would have liked to learn?

Q7 Do you think you will use what you have learnt in this workshop?

[Definitely not / Probably not / Maybe / Probably yes / Definitely yes]

Q8 What do you think you will use?

Q9 What could have been done to improve the likelihood that you would use knowledge from the workshop?

Q10 What was your mode of attendance for the workshop?

[Face-to-face in the same room as the presenter / Remotely via technology]

Q11 If you would be willing for us to contact you so as to provide clarifying or more detailed information then please leave your email address below: