

## Simultaneous Delivery Of Lectures To Students In A Lecture Room And An Online Meeting Room Using The Adobe Connect Teaching Facility

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### ABSTRACT

**INTRODUCTION:** The purpose of this intervention was to investigate students' perspectives of the effectiveness of teaching when two distinct groups were combined during lectures. The two distinct groups consisted of a local (on-campus) cohort, and an online cohort interacting through the Adobe Connect live online teaching facility.

**METHOD:** The combining of lectures involved specific pieces of hardware for various reasons. A pilot study of three lectures was used to ascertain the feasibility of the investigation, after which the remainder of the module was delivered using this simultaneous method. Students were then asked to complete a questionnaire posed using Google Docs, based on their opinions of the entire module.

**RESULTS:** The results showed a spread of opinions among all of the students (n=41), however the overall trend appeared to be in favour of the method of delivery. There were additional comments made (n=3) that focussed on timeliness of answers during the lecture.

**CONCLUSION:** From this investigation, it can be suggested that the effectiveness of teaching when teaching local and online groups simultaneously is not adverse for the module in question. Further implementation of this combined delivery method should be investigated, as well as hardware and software adjustments

### Keywords:

### INTRODUCTION

Online teaching as a tool for tutoring groups that are geographically far-flung has been widely adopted in educational forums at the graduate and undergraduate levels (Wallace, 2010). Various programs and web-based systems are available, containing differing functionality and features, contributing to their adoption into diverse subjects and programmes. The web-based online teaching tool Adobe Acrobat Connect "has great functions and is appropriate for synchronous e-learning" and "make[s] the e-learning process easy and effective" (Garcia, Uria, Granda, Suarez, & Gonzalez, 2007, p.332). Adobe Connect is integrated within the Foundation Degree (FdSc) Dental Technology at Cardiff Metropolitan University to the extent that teaching is executed "live" through this VLE (Virtual Learning Environment) tool. Adobe Connect is used to deliver lectures, host breakout group discussions, display video and photo media, share files, allow chat and interaction between all users along with various other technical features. This learning tool is used in conjunction with two other packages (BlackBoard; an online learning system, and Mahara; an e-portfolio tool), to create an online ecosystem of platforms linked together through the structure and content set out by the designers to create a holistic Virtual Learning Environment. The students use each platform to perform specific tasks. This study,

while acknowledging the VLE as a whole, aims to focus on the amalgamation of live online lecturing through Adobe Connect with traditional face-to-face lectures delivered simultaneously. This application of Adobe Connect is somewhat unique and unexplored within the university and available literature, hence a compelling indication for this investigation.

Adobe Connect has been utilised as a lecture delivery tool in many educational institutes for the sole purpose of distance learning. However, it is of importance to this investigation “to acknowledge that distance education models are also increasingly being adopted for students studying on-campus.” (Smith, Lye, Greatrex, Taylor, & Stupans, 2013, p. 94). This aspect of blended learning for on-campus or local cohorts became a focal point for investigation after a review of financial outgoings for teaching staff within the Dental Technology unit. The delivery team oversees three dental technology programmes running concurrently through the academic year. Of these, two programmes are at the undergraduate level and the third is post-graduate. The two undergraduate programmes are run in differing modes; the full-time (BSc HONS) programme is run in a more traditional format, whereby students attend the campus to undertake practical demonstrations, theory lectures, tutorials and seminars, whereas the part-time (FdSc) is a distance e-learning programme where students meet once a week in online lecture rooms with few visits to campus each year. These two programmes have matched modules at levels 4 and 5, meaning there is some replication in the delivery of modules to the groups. In the interest of reducing staff teaching hours and rationalising staff costs, the aim was to implement and evaluate the simultaneous delivery of a module to local and online student cohorts using Adobe Connect.

#### **Rationale: Efficiency of Teaching**

One objective of the study was to reduce the need for doubling lecture delivery to two different student groups. Prior to this project, module tutors were required to tutor the same module twice; to the local student group and the online student group. The timetabling of the two courses was structured in a way that allotted lecture slots for matched modules were at separate times during the week to deliver to the two groups. The mapping of the timetable was not a complex problem; however a large drawback came from the fact that this dual mode was not financially streamlined. In addition, with certain modules an external tutor was recruited to deliver online lectures as full time tutors had a full teaching timetable, conversely increasing teaching costs further. Much research into online delivery of lectures has reported reduced costs in relation to reduced attendance time, as reported by Senthil, Kumar and Srivatsa (2012). These reduced costs derive from many factors, including reduced commuting and subsistence costs, lower paper printing and distribution expenditure and a reduction in tutor support hours. The last point, while included for a holistic view of cost benefits, is one of focal importance in the arena of learning and teaching. While a reduction in tutor support hours could be viewed in brief as detrimental to the traditional learning mode, it should be noted that an effective measure to increase efficiency of tutor contact is to increase the size of the target audience, spreading the tutor costs over a larger number of students (Senthil Kumar & Srivatsa, 2012).

#### **Effectiveness of Teaching**

While financial incentives are an important driver for this research, it is vital to note that the research was intended to assess any change in quality of teaching and learning foremost, with any financial benefits of secondary importance. The fore-running aim was to investigate any changes in the *effectiveness* of learning achieved by student groups when delivered live lectures simultaneously (online and locally). Many published

investigations report that e-learning is as “effective in terms of knowledge retention and embedding real learning as other forms of learning, primarily classroom based instruction” (Epic Learning Group, 2013). This is not to say that any design of classroom based instruction, when delivered online, will produce an equally effective tool for learning. E-learning tools should be carefully constructed and designed in order to support and enhance the student’s learning experience, as students “use learning strategies that are different from what they are used to in the traditional didactic, lecture-based classroom” (Huang & Zhou, 2005).

Teacher *immediacy* is defined as being “conceptualized as those nonverbal behaviours that reduce physical and/or psychological distance between teachers and students” (Andersen, 1979, p. 541). Further descriptions and definitions have been published by Mehrabian (1969), Gorham (1988), Sanders & Wiseman (1990), and Thweatt (1999). Teacher immediacy relates to traditional face-to-face teaching modes, where students are able to witness and interact with the tutor in a natural social setting, enhancing their learning experience through social connections. This concept is supported as having great impact on the effectiveness of learning, notably because there exists “an instructor-centred perspective of the teaching-learning relationship where the teacher plays a central and authoritative role in the classroom” (Rourke, Andersen, Garrison, & Archer, 1999, p.5). However, it has been noted that the application of the theory of teaching immediacy within online education needs reconsidering, as the interaction between students and tutors involves different aspects of social behaviours (Rourke et al. 1999). This sentiment is in agreement with Woods and Baker (2004, p. 1), who state that

*“Failure to fully consider the relational dynamics in the online setting may produce greater feelings of isolation among distance learners, reduced levels of student satisfaction, poor academic performance, and increased attrition.”*

Immediacy within an online environment is developed through three sources, described by LaRose and Whitten (2000) as being the teacher, the students, and the computer, contributing to “instructional immediacy”. A similar sentiment was also suggested by Moore (1989), who considered three sources of interaction to be learner-content interaction, learner-instructor interaction, and learner-learner interaction. His definitions of learner-content interaction broaden to identifying not just the content itself, but also the medium of content delivery (in the case of this investigation, Adobe Connect). These two studies support the view that the operational and management aspects of the delivery software(s) when tutoring online need to be seamless in appearance, however technical the procedures may be in reality. This potentially encourages confidence in the tutor and perhaps initiates teacher immediacy in turn.

When considering the aspects of immediacy in respect to simultaneous delivery between online and local students, a gap can be postulated between the two groups’ potential exposures due to their immediate environments. However, different surroundings don’t necessarily correlate to being negative, perhaps simply *different* in terms of achieving motivation through various immediacy sources. The interaction between the tutor and the student groups needs to be the central focus and main source of immediacy for both groups in order to create some semblance of homogeneity of effective learning environments.

## Measuring Effectiveness of Teaching

The measure of effectiveness of teaching has been carried out in many various ways previously, although there seems to be a bias towards the value of student evaluations of teaching (SET). A study entitled *“Student ratings: The validity of use”* states that “student ratings are the single most valid source of data on teaching effectiveness” (McKeachie, 1997, p. 1219). Student evaluations of teaching are mentioned by the Quality Assurance Agency for Higher Education (QAA) in the following excerpt:

*“Effective learning environments and teaching practices, including curriculum content, design and delivery, are informed by: current developments in learning and teaching practice; current research and scholarship; changes in professional, practice and work-based environments; feedback from students collectively and individually from module level and upwards; and the requirements of PSRBs.”* (The Quality Assurance Agency for Higher Education, 2012, p. 8)

Student Evaluations of Teaching (SET) are not only considered valid, but some advocate their use to be integral to Higher Education (HE) (Shevlin, Banyard, Davies, & Griffiths, 2000), perhaps because “Such information can be of use to academic departments in constructing normative data for the evaluation of teaching and may aid the individual instructor in improving his teaching effectiveness” (Costin, Greenough, & Menges, 1971, p. 530).

Regarding the literature available, and considering the structure of the VLE used in the programmes in question, SET was considered a valuable source of information to evaluate this intervention. The aim was to implement the simultaneous delivery of a module and evaluate the effectiveness of teaching, as considered by the students, when using this mode.

## METHOD

### Specifications and Hardware

The implementation of this teaching intervention involved a merger of two existing modes of delivery running in parallel to each other. Prior to carrying out this intervention, I had gained varying experience in both fields of teaching modes, and was somewhat fluent with the use of Adobe Connect from a technical viewpoint. However, as the combination of delivery modes is seemingly new, an initial three pilot sessions were planned within the overarching study to evaluate a module delivered entirely using simultaneous teaching.

The hardware requirements to be met for the tutor’s PC (see Appendices 1-3), as well as the layouts of pods (window panes containing specific teaching tools, e.g, chat pod for text communication) within the Adobe Connect screen and the monitoring of chat amongst online students were noted as things to be aware of during delivery. The latter point was considered a potential on-going issue during lecture delivery, hence the plan to run three pilot sessions at the start of the module. The plan for the pilots was to have two tutors present in the lecture laboratory; one to deliver the content of the lecture and run the presentation software, and one to observe and monitor the distance delivery software (Adobe Connect). Three pilot sessions at the start of the module were thought to be sufficient in order to decide on the continuation of simultaneous delivery for the rest of the module.

Prior to the pilot sessions, it was vital to ensure the PC setup within the lecture lab met the specifications required to run Adobe Connect (see Appendix 1) and the presentation software (PowerPoint and Prezi). In addition, there were extra hardware considerations to be made, including connecting a second monitor to the PC to avoid “stacking” of open windows when running multiple programs. The two monitors were connected in “extended display” mode, meaning the PC uses them separately allowing different program windows to be opened on each screen. This technique stemmed from the issue of being occasionally blind to certain aspects, for example when displaying a PowerPoint slideshow in full screen with a single monitor, the user cannot pick up any incoming chat or other notifications from the online students as the Adobe Connect window becomes stacked “behind” the slideshow.

Another important consideration for simultaneous delivery different to standard adobe sessions was the use of a wide lens HD webcam (see Appendix 2). This allowed for a wider view of the presenter during delivery, meaning the tutor can wander to some extent. The freedom offered was thought to somewhat naturalise the environment for the tutor and the students. It was also thought to bring a real-lecture environment feel to the online group, when faced with a tutor standing at the front of a lecture lab and not sitting at a desk. Along the same theme, a Bluetooth wireless earpiece and microphone was included (see Appendix 3). The use of a single earpiece brought about the advantage of the tutor being able to clearly hear input from both student groups. (The regular setup for Adobe Connect lectures within the FdSc program utilises two-ear headsets for maximum immersion during lectures especially regarding student input.) For situations where sound may need to be played to the room, a standard PC speaker setup was connected. This was intended for conference call type meetings, when verbal communications from online users needed to be broadcast to the lecture lab group. In such an instance, the microphone input to Adobe Connect would be through the webcam microphone. Again, this supports the conference-call type meeting, where communication from anyone in the lecture lab can be provided to the online users.

### **VLE Organisation**

The module-long management of the virtual meeting room did not differ in use between the FdSc programme and simultaneous delivery. Prior to the module starting, a meeting room was created to be accessed throughout in order to simplify the weekly logging in process. The URL

([http://adobeconnect.uwic.ac.uk/dent\\_mat\\_a/](http://adobeconnect.uwic.ac.uk/dent_mat_a/)) was posted as a direct link within the Dental Materials A module folder on Blackboard. A link entitled "Adobe Recordings" was posted in the left hand navigation pane, within which were contained sub folders distinct to each year group and pertinent modules. These folders were updated weekly with links to the latest recordings. This familiar theme between modules of placing similar metadata in common sub folders within the VLE was considered an advantage to the students' experience of the VLE by the delivery team. The recording of lectures was a part of the programme-team's procedure; after previous team meetings, it was agreed that recording all Adobe lectures should be the norm across modules.

The BSc module had not previously had any module delivery via Adobe Connect. In this respect, there was no existing "Adobe Recordings" link in the navigation pane of Blackboard. As no other modules were being trialled for simultaneous delivery, an "Adobe Recordings" sub-folder was created within the Applied Dental Materials 1 module folder. This was slightly different from the FdSc module design in order not to alter the BSc folder arrangement in any obvious way to students not enrolled on the module. Within the Recordings sub-folder, there were no differences to the FdSc layout. Each lecture recording was given a title that included the date of

delivery, as well as the title of the lecture. It was revealed in previous student feedback that using dates to mark lectures was useful for ease of identification, and this was therefore applied across the board.

It should be noted that the lecture recordings for simultaneous delivery were made within Adobe Connect. This indicates that viewing the recordings is only from the online delivery point-of-view, and not the lecture lab. This leads to a situation where the local students are able to view lectures from both aspects, whereas the online group are limited to viewing the lectures solely through Adobe. More research is suggested in order to ascertain whether this potentially creates differences in the learning experiences, and whether a live lecture theatre software recording could be incorporated (e.g. Panopto) to balance the bias.

### **Evaluation**

The evaluation of this module delivery was carried out using a questionnaire posed to the students using blackboard. The questionnaire (Figure 1) was designed in order to ascertain students' opinions of their learning environment, experience and ease of use, specifically in relation to the simultaneous delivery aspect. The questionnaire used for the investigation was an edited version of an existing SET questionnaire (**SEE APPENDIX**), used to evaluate students' views on the technology utilised in online lectures. For this reason a pilot questionnaire was considered unnecessary.

The questionnaire was designed using Google Docs and embedded within the Announcements panel in Blackboard, to allow students to complete the questionnaire within the familiarity of the VLE. Reports of completed questionnaires were emailed immediately. The questions were a combination of rating scale responses, yes/no responses, multiple-choice and an additional comments section at the end.

There was no question to clarify whether the participant was from the local or the online cohort. This was done in order to maintain the premise of a combined cohort of peers among the students participating. As the questionnaires were completed anonymously, there was no way to prevent students from completing the questionnaire twice. However, assuming all students completed the questionnaire once, all members of both cohorts participated in the evaluation.

**Figure 1**

**EVALUATION QUESTIONNAIRE**

As part of the evaluation and development of the dual delivery of theory lectures for future implementation, we welcome your views on the delivery of the “Dental Materials 1/A module”. Please circle ONE RATING ONLY per question.

Would you describe the lecture environment as?

Intimidating                  Formal                  Informal                  Relaxed

Was the information presented to you in a clear and legible manner?

Perfectly                  Very clear                  Fine                  Not very clear                  Not at all

Were you questioned about content during the lecture?

All the time                  A lot                  Some                  A little                  Not at all

Were you offered an opportunity to ask questions?

No                  Yes

Did you feel involved in the lesson /did you feel part of the class?

Very much                  A lot                  Some                  A little                  Not at all

How appropriate/well utilised was the use of technology during the lesson?

Very                  Quite                  Okay                  Not very                  Not at all

This question is for the **Adobe Connect** users only: Where did you access the lesson?

Workplace (Lab)                  Internet Café/library (PC)                  Home                  Public area Wi/Fi

There is space provided below for you to make any other comments on this topic, and is an opportunity to offer positive and negative comments. (Feel free to continue onto another sheet/over the page if necessary)

**RESULTS**

This section will present the raw data from the survey results, and a more in-depth discussion will follow in the “Discussion” section. The questionnaire results were collated within a Google Docs spread sheet, and annotated into Table 1 below. A total of 41 (n=41) questionnaires were completed, with two of the closed-ended questions not being answered by all participants (see asterisks\*\* in question column below). The “additional comments” section was filled-in by 5 participants. These raw answers are shown in Table 2.

Table 1

Q1: Would you describe the lecture environment as?	Intimidating	Formal 7	Informal 6	Relaxed 28	
Q2: Was the information presented to you in a clear and legible manner?	Perfectly 5	Very clear 21	Fine 13	Not very clear 2	Not at all
Q3: Were you questioned about content during the lecture? **	All the time 2	A lot 15	Some 18	A little 5	Not at all
Q4: Were you offered an opportunity to ask questions?	No	Yes 41			
Q5: Did you feel involved in the lesson /did you feel part of the class?	Very much 11	A lot 19	Some 7	A little 2	Not at all 2
Q6: How appropriate/well utilised was the use of technology during the lesson?	Very 17	Quite 19	Okay 5	Not very	Not at all
Q7: This question is for the Adobe Connect users only: Where did you access the lesson? **	Workplace (Lab) 12	Internet Café/library (PC)	Home 13	Public area Wi/Fi	

For the following descriptions, all percentages have been rounded to the nearest unit. From Table 1, it can be seen that there was a spread of answers for the majority of questions. The answers for Q1 indicate most students felt relaxed ( $n=28$ ) using this method of lecture delivery. This represents 68% of the mixed cohorts. The remaining answers were almost evenly split between **formal** and **informal** ( $n=7$  and  $n=6$  respectively). No students selected **intimidating** for this question.

For Q2, 51% of answers selected that the information presented was **very clear** ( $n=21$ ), while 31% ( $n=13$ ) selected **fine**. A small percentage of answers ( $n=2$ : 5%) selected **not very clear**. Anonymity prevents revealing which student group these answers came from.



Not all participants answered Q3- a total of 40 responses were recorded. The majority of answers provided were fairly evenly spread between **a lot**, being 37% (n=15) and **some**, being 44% (n=18) for how often the students felt they were questioned during lectures. A small 12% (n=5) selected **a little** for this question. No answers selected **not at all**.

All answers provided for Q4 (n=41; 100%) selected **yes** to being provided opportunities to ask questions during the lectures.

Perhaps interestingly, the answers for Q5 were spread across all options. This question asked whether students felt involved in the lessons- their feelings towards this aspect of the study are arguably a central factor to the intervention. The majority of answers (46%) selected **a lot** (n=19), followed in decreasing order by **very much** (n=11; 27%), **some** (n=7; 17%), **a little** and **not at all** (n=2; 5% for each).

The last question intended for both groups (Q6) showed the opinions of how well the technology was used were fairly equal between **very well** and **quite well** (n=17; 41% and n=19; 46% respectively). Just 5 selected **okay**, with no answers selecting the negative options.

The comments received for the final question are listed in Table 2, un-edited from source.

**Table 2 : Un-edited additional comments**

I feel in lectures where students are actually present in the lecture room, a lot of the questions posed by those online get missed or aren't answered for a good while. Personally I find the lectures hard to follow if something is troubling me that has not yet been answered. The online lectures are a great idea, but I find it quite difficult to learn during these times as I always have a lot of questions to ask (as I don't always understand what I'm being taught). I'm also a visual learner, which is probably part of the problem because unless I see a process in action, I often don't understand it.

I didn't realise that we had to know so much more in comparison to the lectures, which came as a shock to me when I came to revise. Maybe a heads up on the amount of work required would have been nice. But apart from that the lectures were great.

I found this lecture alot harder to follow than the one we have face to face without a classroom of students. Even though they did try and include us in the lesson, I did feel at times that we were just spectators. There were several times where I did not understand something so I would type a question asking for futher explanation e.g 'I do not understand that last bullet point?' but this message may not be seen for 5 /10mins or so; by which point they have moved on from that particular slide and are talking about something else. So when the question is eventually seen, it then takes several more messages and time to establish what I was referring to and go back and find that slide....with our other subject the lecturer is positioned right in front of the camera and answers questions pretty much straight away which makes things alot clearer. I don't feel particularly engaged with the duel lesson and would much rather it was delivered directly at us instead of trying to combine the two. Being distant learners we get so little time with the teachers that I feel a little more direct time would give us a much stronger learning experience. Please note that my comments are by no means ment as a criticism of the lecturer but more in the way it is delivered to us.

Feel quite isolated and not able to ask specific questions. The answers are generalised towards everyone rather than exact answers. It would be good to have more time online with tutors. All else is great!

need more explanation for each lecture as i feel

## DISCUSSION

The results from Table 1 suggest that the overriding student opinions of simultaneous delivery are that it was not detrimental to the learning experience. The answers showed that the majority of students felt the simultaneous delivery was well managed and utilised in a way that involved and engaged both parties. This is supported by the majority of answers falling into the positive end of the ratings for Q2 and Q6. These questions relate to the tutor's use of the presenting and delivery tools (Prezi and Adobe Connect respectively) during lectures. This is an important point to consider: the use of the medium is just as important as the delivery of the content when teaching, as agreed by LaRose and Whitten (2000) and Moore (1989), suggesting that computer/content immediacy is one of the 3 sources that make up instructional immediacy. This highlights the importance of tutor fluency with the technology, and the need to create an appearance of a seamless conjunction between the various programmes being used. It also supports the fact that the lectures for the module in question were designed aptly for delivery through online lectures. When designing this intervention, the research showed that not all lectures are adequate for delivery through e-learning, as mentioned previously, and supported by Huang & Zhou (2005). The module in question was primarily fact-based, presenting the facts and figures relating to dental materials, their constituents, constituent ratios, and manipulation. It was felt that the didactic nature of existing teaching methods of this module correlated well to online delivery, and specifically simultaneous delivery. This seems to be supported in this investigation, indicating successful application of Adobe Connect within this module.

The answers provided for Q1 and Q5 suggest that the majority of students felt involved and relaxed within the lectures for the module. These questions relate to the student-teacher interaction and immediacy, and how much social connection is achieved during lectures. The role of the tutor is central in this respect, and creating a sense of interpersonal communication with the students. This sentiment is supported by Woods and Baker (2004), who state that "[Tutors] Asking questions, using humor, addressing individuals by name, initiating discussion, and sharing personal examples are verbal behaviors which produce immediacy and contribute to a sense of psychological closeness." These actions are natural social interactions, and can therefore be easily applied to both student groups in simultaneous delivery, via live video and audio streaming through Adobe Connect to the online students, and the proximity of the local students. In a sense, neither group loses out in this respect.

The answers for Q3 and Q4 probe students' thoughts regarding their interaction with the tutor about the information being conveyed. All students were encouraged to communicate and feedback during lectures, whether a question arose, or to answer questions posed, or for any other reason. The feedback of online students was mainly through text chat into the meeting room; however there were occasions when students felt the need to speak to the tutor. In these instances, audio and video were enabled for the student in question, to allow the group to see and hear the student's feedback. This supports the idea that the online students felt comfortable to communicate during the lectures and ties in with the results provided for Q1 and Q5. There was no noticeable difference in willingness to interact between the groups during lectures,

suggesting a level of equity between the groups. As this observation is supported by the answers in the questionnaire, it suggests an effective measure of engaging students through teacher immediacy for this module and delivery mode.

The questions for Q3 and Q4 enquire about questions during the lectures; Q4 is straightforward in illustrating that students felt they had opportunity to query and ask questions during lectures. This was intended during delivery: to afford all students the chance to ask questions at any point during the lecture. Online students have the option to type a question directly into the chat room at any point, or they can use the "Raise Hand" icon to indicate to the tutor they wish to speak. The local students were able to simply raise a hand, or speak up at any point they felt necessary to pose a question. The answers for Q3 are somewhat spread, with 15 students choosing that they were asked questions a lot, and 18 referring to being questioned some times during lectures. Additionally, 2 students thought they were questioned a lot, while 5 thought they were questioned a little. This range of answers indicates the tutor's attempts to engage the students by posing questions were viewed differently in terms of how often students felt they were asked a question. The process of asking questions at certain points during lectures was a continuation in delivery plans from before the module was amalgamated into simultaneous delivery. Questions were commonly enquiries based on current knowledge, i.e. word definitions, in an attempt to relate students to new knowledge.

The "additional comments" section drew the attention of five students, as seen in Table 2. These answers were open-ended; to draw out any specific details students may wish to expand upon. From the answers given, the theme seems to converge around timeliness of answering typed questions. This would suggest that these are views held by the online group of students. Some answers point to feeling "isolated" and suggestions of not feeling "particularly engaged", and being "just spectators". One other answer refers to the workload, while the final answer is incomplete. The theme of these answers seems to be something not to ignore, especially as they relate directly to the live management of the online system during the lectures. From memory, there are a small number of times that can be isolated where similar issues occurred. During the lectures, it is all questions were encouraged to be asked at any point, and the views presented here contradict that effort unfortunately. It has been noted that the chat text box in which any textual feedback appears can be made larger, to increase visibility during the lecture and to prevent any instances of missed feedback. This also suggests perhaps further investigation into hardware or software changes that could help prevent these occurrences.

The spread of answers throughout this investigation may be an indicator that the questions fail to engage students enough during lectures, and therefore do not have a positive influence on effectiveness of teaching in this module. Further research is perhaps necessary to explore this idea some more- both in relation to simultaneous delivery and traditional online/local delivery modes of this module.

The results in this study *could* be viewed as illustrating a certain level of equality among the two cohorts regardless of their location during the lectures. This assumed similarity in the geographically separate student groups involved potentially lends support to the intervention by virtue of the anonymity of questionnaires. Anonymity allows a rather blanket conclusion to be made of the two groups' views towards simultaneous delivery. However, anonymity also more definitely indicates a further study should be carried out for this particular module, in which student cohorts are identified and compared. This would present more accurate, usable results regarding simultaneous delivery of the module in question. Additionally, to further ascertain the

effectiveness of this delivery method, other modules within the same and other institutions should pilot and investigate similar delivery modes.

From my position during this intervention, a few notable observations were made of operational interest. The management of the various systems (adobe connect and presentation programs) became less of a concern after the pilot lectures, allowing more attention and focus on the delivery of the lectures. This was viewed as being akin to learning to drive a car, whereby drivers contend with learning the operation of the vehicle as well as the rules of the road in the beginning, and gradually the acts involved in the operation of the vehicle become subconsciously controlled. It is thought that this would be a similar experience to any other users of this mode of delivery; however it should be reiterated that I had gained previous experience with e-learning modules delivered using the same tools, as well as having an initial pilot study whereby an additional tutor was present in the room to assist in the control and management of Adobe Connect. It would be wise to suggest any adoption of this or a similar intervention utilise a pilot study in the same manner prior to starting.

## CONCLUSION

This intervention has illustrated that there is a certain level of effectiveness felt among the student groups when lessons are delivered in a simultaneous mode. This illustrates that the module has been designed somewhat successfully to involve two geographically separate student groups with different study environments. This leads to indicating further use of this delivery method for the module in question; however some evolution in the delivery is expected to occur as a result of this investigation, e.g. probing students with questions during lectures perhaps needs further development into discussion groups. Additionally, further research is indicated to investigate areas exposed in this investigation.

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**APPENDIX 1: PC REQUIREMENTS FOR USING ADOBE CONNECT**

**Microsoft® Windows® 7 Home Premium, Professional or Ultimate (32-bit edition, or 64-bit edition with 32-bit browser)**

- Microsoft Internet Explorer 8 or later
- Mozilla Firefox 3.x
- Adobe Flash Player 8 or later

**Microsoft Windows Vista® Home Basic, Home Premium, Ultimate, Business, or Enterprise (32-bit edition, or 64-bit edition with 32-bit browser)**

- Microsoft Internet Explorer 7 or later
- Mozilla Firefox 2.x, 3.x
- Adobe Flash Player 8 or later

**Microsoft Windows XP Professional or Home Edition with Service Pack 2**

- Microsoft Internet Explorer 6 or later
- Mozilla Firefox 2.x, 3.x
- Adobe Flash Player 8 or later

**Windows hardware requirements**

- Windows XP: 450MHz Intel® Pentium® II or faster processor or equivalent (128MB of RAM, 512MB recommended)
- Windows Vista: 1GHz Intel Pentium II or faster processor or equivalent (1GB of RAM)

**Mac OS X v10.4, 10.5, 10.6 (Intel)**

- Mozilla Firefox 2.x, 3.x
- Safari 2.x, 3.x, and 4.x
- Adobe Flash Player 8 or later

**Mac OS X v10.4 (PowerPC®)**

- Safari 2.x
- Mozilla Firefox 2.x, 3.x
- Adobe Flash Player 8 or later

**Mac OS hardware requirements**

- 500MHz PowerPC G3 or faster or 1.83GHz Intel Core™ Duo or faster processor
- 128MB of RAM (512MB recommended)

**Linux®: Red Hat® Enterprise Linux (RHEL) 4.x, 5.x; Novell SUSE® 9.x or 10.x**

- Mozilla Firefox 2.x, 3.x
- Adobe Flash Player 9 (Adobe Flash Player 10 available for Red Hat 5)

**Solaris™**

- Mozilla Firefox 2.x, 3.x
- Adobe Flash Player 9 or later

**Additional requirements**

- Bandwidth: 56Kbps

**APPENDIX 2: LOGITECH B910 HD WEBCAM****System Requirements**

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- UVC mode (No software installation required):
  - Windows® XP, Windows Vista®, Windows® 7, or Windows® 8

Drivers provided for 32-bit and 64-bit versions of Windows XP, Windows Vista, Windows 7 or Windows 8

Microsoft® Office Communicator 2007 R2 or (higher) video conferencing requirements:

- OS: Windows XP (SP2 or higher), Windows Vista or Windows 7 (32-bit or 64-bit versions)

HD video (720 x 1280) at 30 fps

- CPU: Quad core 2.0 GHz or higher
- RAM: 2 GB or more
- Upstream bandwidth: 1.5 mbps

VGA video (640 x 480) at 30 fps

- CPU: Dual core 1.9 GHz or higher
- RAM: 1 GB or higher
- Upstream bandwidth: 600 kbps

For CIF (352 x 288) at 15 fps

- CPU: Single core 1.5 GHz or higher
- RAM: 512 MB or higher
- Upstream bandwidth: 250 kbps

- **Drivers/Software Downloads Required?**

Optional; driver for advanced settings.

- **Application Compatibility**

- Windows® XP, Windows Vista®, Windows® 7, Windows® 8
- Mac iOS 10.7 or higher

- **Certifications**

Optimized for Microsoft® Lync™ and Skype, Cisco® compatible, certified for Avaya and Avistar

**Warranty Information**

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- 3-year limited hardware warranty

**Package Contents**

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- B910 HD Webcam
  - External Privacy Shutter
  - Universal monitor clip
  - Installation CD
  - User documentation
- \*\* Software installation required for RightSound technology.*

**Part Number**

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- PN 960-000684

**Technical Specifications**

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- Carl Zeiss® glass lens
- Autofocus system
- 78-degree wide-angle field of view
- High-definition video in 720p widescreen mode with recommended system
- Color depth: 24-bit true color
- Frame rate: Up to 30 frames per second streaming video at 720p and VGA mode
- Full HD 1080p Video Recording
- Photo capture: 5 million pixels

- External Privacy Shutter
- USB cable (6 feet/1.8 meters)
- Built-in dual microphones
- Hi-Speed USB 2.0 certified
- Universal clip fits laptops, LCD or CRT monitors
- UVC compliant
- Works with most instant-messaging and video-conferencing applications
- Optimized for Microsoft® Lync™, Skype™, Cisco® compatible, certified for Avaya and Avistar
- Logitech webcam drivers support HD audio, RightLight™ 2 technology

**APPENDIX 3: JABRA GO 660 BLUETOOTH HEADSET**

- General

**Packaged Quantity:** 1

**Product Type** Headset - Bluetooth 2.1 EDR

**Width** 0.7 in

**Depth** 1.9 in

**Height** 1.1 in

**Weight** 0.4 oz

**Recommended Use:** Cellular phone, Notebook

**Additional Features**

Dual microphones,  
 Call reject,  
 Noise Blackout Extreme technology,  
 On/off switch,  
 Battery level indication,  
 Built-in DSP,  
 Multiuse,  
 Volume control,  
 Voice dialing,  
 Answer/end button,  
 Mute button,  
 Last number re-dial,  
 Data encryption

- Headphones

**Headphones Form Factor:** Ear-bud - Over-the-ear mount

**Connectivity Technology:** Wireless - Bluetooth 2.1 EDR

**Bluetooth Profiles**

Advanced Audio Distribution Profile (A2DP),  
 Hands Free Profile (HFP),  
 Headset Profile (HSP)

**Sound Output Mode:** Mono

- Microphone

**Type:** Built-in



- - Remote Control
- Type:** None
- Wireless Link
- Transmission Range:** 33 ft
- - Connections
- Connector Type:** Bluetooth
- - Miscellaneous
- Included Accessories:** Bluetooth adapter
- - Power
- Battery:** Headset battery - Rechargeable
- Run Time (Up To):** 5.5 hour(s)
- Standby Time:** 252 hour(s)

**APPENDIX 4: EXISTING SET QUESTIONNAIRE, ADAPTED FOR THIS INVESTIGATION**

**LECTURE EVALUATION QUESTIONNAIRE SW Eng Blended learning project (ii)**

**Technology**

As part of the evaluation and development of the lectures offered and for future lectures we would welcome your views on this one.

Please circle ONE RATING ONLY per question.

**Total amount of lecture time spent on the subject areas?**

Too much time    5        4        3        2        1        Too little time

**Would you describe the classroom environment as:**

Intimidating                      Formal                      Informal                      Relaxed

**How appropriate was the use of technology during the lesson?**

Very                      5        4        3        2        1                      Not at all

**Did you contribute to any ‘polls’?**

Lots more                      5        4        3        2        1                      None at all

**Did you feel involved in the lesson /did you feel part of the class?**

Very                      5        4        3        2        1                      Not at all

**Where did you access the lesson?**

Workplace-lab    Workplace-office    Home    Office    Other (please state)

**Would you have preferred to have sat in on a “traditional” lecture at UWIC?**

No / Yes

There is space provided below for you to make any other comments on this topic, and is an opportunity to offer positive and negative comments. (Feel free to continue onto another sheet if necessary)

Finally, thank you very much for completing this questionnaire