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BLENDED LEARNING: WHAT KIND OF FIT FOR THE NETGEN?

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Abstract

This paper reports on a pilot project conducted with under-graduate students in pre-service teacher education programs. The aim of the project was to accommodate student requests for unit flexibility underpinned by a blended learning approach. The grounds for using this approach were: effective modelling of Information, Communication and Learning Technologies (ICLTs) pedagogies to pre-service teachers, flexibility for students in regards to the time required to attend lectures and review lecture materials, economic rationalism, and decreasing lecture attendance. The tools used to support the blended learning included video recordings of the PowerPoint presentations of the lectures using *Camtasia Studio*, online quizzes to support the key messages of the lectures, online discussion threads, and face-to-face two hour tutorials. Data were collected at the completion of three different curriculum units, and included student feedback (using *Survey Monkey*), and semi-structured focus group interviews. The findings will provide information on the preferred learning style of the NetGen cohort currently engaged in higher education. Furthermore the findings of this project will form the basis for a cross-institutional study, and reconceptualisation of service delivery for tertiary education students. This project will lead to a second study in which the parameters of the blended learning will be expanded and informed by the initial data.

Key Words

Pre-service teachers, blended learning, ICTs.

Introduction

The trend in higher education to replace or supplement traditional pedagogical methods such as paper-based or face-to-face instruction with online instruction has increased over the last few years. While there is a body of research which compares web-based courses with traditional classroom-based courses (for example, Gal-Ezer & Lupo, 2002; Hughes, McLeod, Brown, Maeda & Choi, 2007; Meyer, 2003; Olson & Wisher, 2002; Toth, Fougler & Amrein-Beardsley, 2008) no consensus has been reached on the impact of the change of mode on student learning. This has particular bearing on teacher education programs that must take the responsibility for instructing pre-service teachers on the effective use of digital pedagogies and associated ICTs in the classroom as well as the modelling of such practices by the tertiary educators who implement these programs.

The advantages of online instruction are clearly established for example: web-based courses can be used to meet the needs of non-traditional students, leading to more open access to higher education (Mottarella, Fritzsche & Parrish, 2004), and allows more flexibility for learners (Allen & Seaman, 2006; Larkin, 2010). Furthermore, in contrast to some other forms of instruction, online instruction is seen as providing more

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interactivity, in relation to peers, tutors and the course material itself (Li, 2007), and this interactivity is seen as having impacts on student engagement, learning, and motivation (Katz & Yablon, 2002).

From a student viewpoint, Prensky notes, "our students are clamouring for these [new] technologies to be used as part of their education, in part because they are things that the students have already mastered and use in their daily lives, and in part because they realise just how useful they can be" (Prensky, 2007; p. 41). Supporting literature also suggests that this generation of students who have been born into the digital age (*NetGen*) prefer receiving information quickly; are proficient at processing information rapidly; prefer non-linear access to information; have a low tolerance for lectures; prefer active rather than passive learning, manage multiple priorities of which study is only one; have an expectation of 24 access to all services including educational ones; and rely heavily on communications technologies to access information and to carry out social and professional interactions (Arhin & Cormier, 2007; McGarr, 2009; Nimon, 2007; Oblinger, 2003; Pardue & Morgan, 2008; Pendergast, 2007; Skiba, 2005).

While the potential positive outcomes of web-based courses are acknowledged, some researchers are wary of the pace of the move from traditional to online instruction (or elearning as it is often referred to) and are not convinced that the online mode does result in equivalent or improved student outcomes (Ali & Elfessi, 2004; Brown & Liedholm, 2002; McLaren, 2004; Njenga & Fourie, 2010; Toth et al, 2008). Their concerns are that the claims of elearning (for example that it saves time, physical and consumable resources, and enhances student learning) are untested and that there are few researchers expressing scepticism or empirically testing these claims (Emerson & MacKay, 2011). In the context of teacher education programs where the ultimate goal is to equip new teachers with a range of pedagogical practices (from real-time, face-to-face interaction to asynchronous virtual engagement) consideration needs to be given to the modes of instruction that would best cater for these needs. According to Bate (2010) this should also include instructional technologies that are currently being used in schools whilst also equipping them with ICLT pedagogy. The pilot study reported in this paper investigates the impact of a *blended learning* approach (Concannon, Flynn & Campbell, 2005; Craig, Wozniak, Hyde & Burn, 2009) to the instruction of three individual units that are parts of current teacher education programs.

Blended Learning

In an effort to combine the best features of online learning and traditional classroom learning hybrid or *blended* courses evolved (Dziuban, Hartman, & Moskal, 2004; Graham, 2005; Martyn, 2003; Reasons, 2004). The blended learning course model essentially comprises classroom face-to-face interaction and online computer-assisted student learning and management systems (Baugher, Varanelli, & Weisbord, 2003; Bonk & Graham, 2005; Brew, 2008; Georgouli, Skalkidis, & Guerreiro, 2008; Mitchell & Honore, 2007; Yudko, Hirokawa, & Chi, 2008). Blended learning courses have significant e-learning activities, including online quizzes and synchronous or asynchronous discussions, in addition to traditional classroom face-to-face teaching and learning. Although the blended learning is starting to be seen as a viable solution to the problems of online and traditional classes, feedback is cautious, yet primarily positive (Reasons, 2004). Studies have shown that most online learners do prefer some face-to-face contact with instructors and tend to be more successful when this occurs, therefore supporting the blended learning course model (Riffell & Sibley, 2005). Furthermore research shows that this combination has the potential of promoting learner-centred, active and constructive learning (Dori & Belcher, 2005; O'Donnell, Hmelo-Silver, & Erkens, 2006; Salomon & Ben-Zvi, 2006; Stahl, 2006). In essence the

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blended learning mode captures the *what*, the *where*, and the *when* of learning (Hill, 2006).

Methodology

This pilot study sought to progress the research on blended learning as an instructional mode in pre-service teacher education programs. To this end the research questions which framed this study were:
 (1) In what ways do pre-service teachers engage with a blended learning mode of instruction in curriculum units?
(2) How can the blended learning mode of instruction be refined to achieve positive student learning outcomes in the affective and academic domains?

Participants

Pre-service teachers studying at the Australian Catholic University (ACU, Brisbane) from the Bachelor of Teaching/Bachelor of Arts (BT/BA, 4 year dual degree), the Bachelor of Education (Primary), and the Bachelor of Education (Early Childhood and Primary) were invited to participate in this study in the context of their Study of Society and the Environment (SOSE) and History curriculum unit and their Exploring Mathematics 2 curriculum unit respectively. The participants from the BT/BA unit were first year students, those from the B.Ed. (Primary) were third year students, and the students from the B.Ed. (EC & Primary) were in their second year. In total 43 students participated in the online survey (representing a 15.4% response rate from a potential participant pool of 280) and 20 students participated in focus group interviews. None of these students had had prior experience with blended learning units at university.

Method

A situated case study method was used for this pilot project in order to establish baseline data for further exploration into the effective use of blended learning in the pre-service teacher education programs. All of the students in these units were exposed to the blended learning mode while only the self-selected participants were asked to engage with the survey and the focus group interviews. The two researchers were the lecturers-in-charge of the targeted curriculum units and also were the tutors for these units. Prior to the commencement of semester 1, 2012, the researchers discussed ways in which the learning could be blended in these units. This resulted in these decisions:

1. The weekly lectures for each unit would be video recorded using PowerPoint slide shows which were recorded using *Camtasia Studio* (Version 7.1 © 2010 TechSmith Corporation, MI, USA) so that the lecturer's voice-over could be recorded in synchronization with the slide show. These recordings were all posted at the beginning of the semester on the Moodle site for each unit as MP4 files with each presentation also posted as the PowerPoint slides.
2. The weekly tutorials (90 minutes for the BT/BA students and 120 minutes for the B.Ed. students) were conducted on-campus in the face-to-face mode of groups of between 25 and 35 students.
3. Each unit was also supported on the Moodle site by the uploading of quizzes and web links to relevant sites, the posting of discussion threads, and the situating of unit outlines, criteria sheets and university coversheets.

Camtasia Studio was chosen to record the lectures as opposed to recording of the lectures in the theatres as in the past there had been technical difficulties with the process which frequently resulted in poor quality sound or picture quality, or both. The recording of the lectures was not so much about "seeing" the

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lecturer as it was engaging with the PowerPoint slides and the elaborations made by the lecturers. Students were not required to attend the timetabled lecture for these units; however a 90% attendance rate was required for the tutorials. No recommendations for use of the online materials were suggested by the lecturers.

Data Collection

Data were collected at the end of the semester using an online survey, created using *Survey Monkey* (Appendix A) and five focus group semi-structured interviews (Appendix B) which were audio-recorded and transcribed. The 10 items of the survey sought to investigate the students' use of the online materials, their confidence in using the technology (i.e., the Moodle site), and their self-reported effects on their learning. The statements and questions of the survey had multiple-choice options including *Other (please specify)*. The data obtained using *Survey Monkey* were interrogated using various single and combination fields provided in the software.

Two focus groups came from the BT/BA cohort, two from the B.Ed. (Primary), and one from the B. Ed. (EC & Primary). One researcher conducted the interviews thereby ensuring consistency. The five focus group interviews were transcribed by a research assistant and checked by the researchers for accuracy. NVivo 9 was used to collate themes evident in the participants' responses.

Results

Participant survey

The participants were asked to self-rate their level of confidence with using technology and the majority (51.2%) described themselves as "Expert – I am a very confident user of technology", followed by 44.2% self-rated as an "Average User – I am reasonably confident". Only 4.7% described themselves as being "Novice" hence we could assume they were a cohort that perceived themselves as being technologically able.

The next series of questions were concerned with the videos that were uploaded onto the ACU Moodle site as the alternative to attending lectures. The participants were asked for their general feelings regarding ease-of-use, and 46.5% stated that they had no problems, and 44.2% found them easy to use but sometimes had difficulties, whilst 9.3% had many problems. This may have been due to the format, as the videos were uploaded as MP4 and .avi files, or alternatively due to the University firewall which made the downloading of some files difficult. The way the video files were used was also examined, and in order of preference they were: watched within Moodle (67.4%); downloaded and played on the participants own computer (23.3%) and other (8.8%). Those that selected "Other" for this question stated that they used a combination of downloading (for late consumption) and watching in Moodle.

The participants were then asked about their typical habits using the videos. As can be seen in Figure 1 below, the majority either watched most of the videos (32.6%) or watched all of the videos (32.6%). It was heartening to the researchers that 51.2% of students watched all videos at least once.

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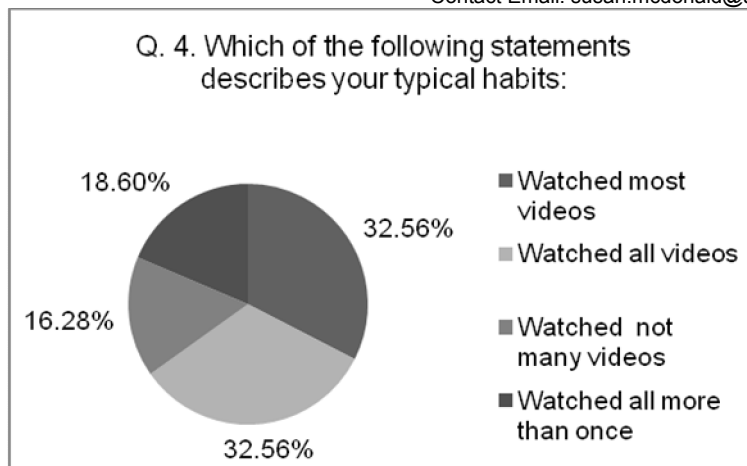Contact Email: susan.mcdonald@acu.edu.au

Figure 1. Typical habits regarding the use of lecture videos.

The study habits and how the videos were typically used were also examined in a bid to understand the types of learning strategies the students engaged in whilst using the materials provided. Each video was presented on Moodle with the accompanying PowerPoint presentation slides for them to access. When asked how they used the materials provided 76.7%, watched the videos whilst making notes on their hardcopy of the PowerPoint slides or in a notebook. Other responses were: watching the videos then looking at the PowerPoint slides (14%) and watching the videos and not using the PowerPoint slides (4.7%).

Question 5 sought to compare the use of lecture videos to their usual attendance at lectures. It was interesting to note that no clear trend could be observed here with the results spread quite evenly between the three options: 34.9% watched videos *more* than they would normally have attended lectures; 32.6% watched videos *less* than they would normally have attended lectures and 32.6% felt it was about the same number of videos as the number of lectures they would normally attend. Hence the use of videos rather than offering face-to-face lectures had no clear positive or negative impact on attendance or engagement with lecture materials. This ambiguity is more interesting when the following result is considered: 65.1% of participants stated that their preferred format for lectures was videos, with only 32.6% preferring face-to-face lectures.

The participants were asked how they felt the combination of online videos with face-to-face tutorials impacted on their learning. As can be seen in Figure 2, 41.9% felt the blended learning approach was *very* effective for their learning; followed by 27.9% for effective, and 20.9% for somewhat effective. It is interesting to note that 9.3% perceived the approach as having a *negative* impact on their learning.

These results seemed to indicate that there was a group of respondents within the participants who did not wholly support the blended approach. The next question sheds some light on this. The participants were asked how long they had been studying at university: 30.2% were first year students; 7% second year; 46.5% third year, and 16.3% were fourth year. These results were then analysed using the filter of the number of years at university, and it was found that second and third students were *more* supportive of the blended approach, whilst first years preferred a more hands-on approach, possibly due to unfamiliarity with university learning environments, a return to study after some time spent working or the style of learning previously experienced within secondary school context.

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Q. 8. How do you think the combination of online lectures (video recordings, quizzes, and discussion threads) and face-to-face tutorials impact on your learning?

- 9.30%
- 20.90%
- 41.90%
- 27.90%

- ■ Very effective
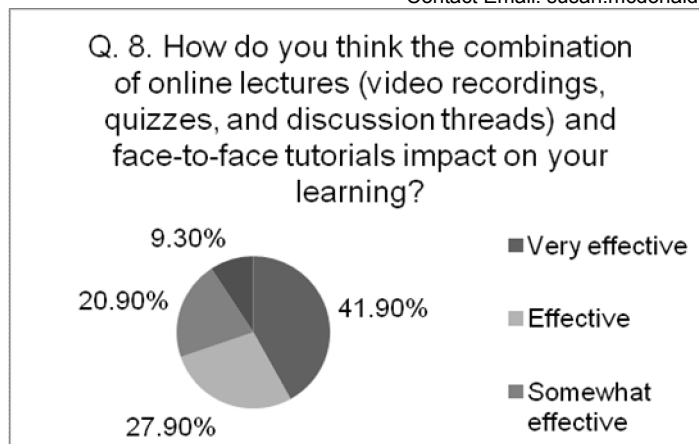- ■ Effective
- ■ Somewhat effective

Figure 2. Perceived overall impact of blended approach on learning

The final question in the survey sought to determine the preferred mode of learning across their university studies. The participants were asked if they would be happy if all their lectures were presented as videos: 41.9% agreed, whilst 37.2% preferred a blend of video and face-to-face, and 18.6% preferred traditional face-to-face lectures.

Focus group interviews

All of the focus groups commented on the following positives of having the lecture videos: (1) able to view videos when it suited the student, (2) able to pause, rewind, and view multiple times, and (3) a feeling of personalised instruction:

(1) *I liked for the fact that I could fit it into my timeframe and I would sit and listen to them the night before a tutorial then I would be able to pause make notes on my print out* (Focus group 1)

One of the main advantages for me was that I could do it in my own time so like fitting in work and stuff with uni is sometimes really difficult so I could do it on the weekends if I needed to (Focus group 2)

(2) *I would have to agree with that basically I loved the fact that you could pause it because it allowed me to get everything written down that I wanted to get written down and if I missed something I could take it back* (Focus group 1)

I liked when you put especially in the fraction section when you had a question and I could actually pause it and try and answer the question before I kept playing whereas you can't always do that in a lecture situation (Focus group 3)

(3) *I found that it was just me and you and that it was more like a personalised lecture* (Focus group 1)

Like the lecturer getting ahead of you when you're still at the same point you can just pause it and write down your notes and things like that and then you can go ahead from where you left off and you're not sort of thinking about wait what is she talking about now (Focus group 4).

The B.Ed. focus groups also mentioned the fact that the recorded lectures were more effective, for example: *often if you sit there for an hour in a lecture you kind of drift in and out whereas these are short and concise ... and if you're not focused then you can come back and do it later* (Focus group 1).

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The participants in both BT/BA focus groups (4 and 5) agreed that they preferred face-to-face lectures and focus group 5 suggested that an even more effective model would be to have the videoed lectures as well as the face-to-face lectures.

One negative aspect of the lecture videos was expressed across all focus groups: no opportunity to ask questions as students would be able to do during a face-to-face lecture. The fourth question of the focus group interview (*Do you feel that you received value for money from this unit? Or did the video recorded lectures have no bearing on this?*) was responded to by only one focus group; all other groups had not considered this aspect. The response that was given came from the B.Ed. (EC & Primary) group and from a mature-aged student.

> *But I have to admit that when we first got the unit outline and it said that the lectures were online instead of coming in… I have to admit… I suppose it's probably because there is an age difference because I am in my 30s, I thought what? I am paying for a course that the lecturer is not even going to lecture… I am going to see it online and I have to admit I felt a bit short-changed at the beginning but after doing it that way because I found it so beneficial for me I actually was ok with that.* (Focus group 3)

This mature-aged student was not considered to be of the NetGen whereas the other students comprising this focus group were aged between 20 and 24 and thus considered to be of the NetGen. Focus group 5 (BT/BA students) was the only one that critiqued the quality of the videos particularly in terms of sound: *The other disadvantage was technical… I think they could be better …a little more effort could go into how they were presented and the quality.*

Discussion

The participants in this project could generally be described as technologically-savvy and able to use the technologies presented to them within the units. It was interesting to note that the majority of them watched the videos within the Moodle environment rather than download the videos and use them in different ways. It was anticipated by the teaching staff that as the lecture videos were in an MP4 format, perhaps they would use mobile devices such as iPads and Smartphones to watch the videos. However it would appear that the students preferred using a traditional computer-device and use the files within the online learning platform of the university. So the use of the lecture videos in a personalised, timely way was not really evident. This was however the first time the students had encountered a unit in which lectures were in this format, hence they were focusing on how to *use and access* the materials rather than use them in a confident and innovative way.

It was interesting to note that the students appeared to be using the videos in a traditional way, in that they were mimicking the behaviours they would normally exhibit within a lecture theatre. They watched the videos, whilst making notes on their printed copies of the PowerPoint slides. This behaviour tends to contradict the notion of them being *digital natives* as they were enacting the practices of *digital immigrants*. It would have been interesting to see the use of electronic notes or other etools by the students. One point that emerged in the focus group interviews was the sense that the videos made the learning materials appear to be more personalised. This was an interesting observation, as it is a weakness of the large-scale lecture formats commonly encountered in university, in which students often feel de-personalised and disconnected from their lecturers. The videos would appear to be able to overcome this sense of disconnection, and make the experience more personal and perhaps more meaningful for the learner. This needs further exploring, as it has ramifications for student engagement, overall levels of motivation in their studies, and positive learning outcomes and academic success.

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The overall impact on learning was conservative, with only 41.9% of the participants feeling it was a positive experience which was consistent with the number who felt that it would be their preferred mode for delivery of lectures (41.9%). This result is interesting as there would appear to be a reasonable portion of the student group who enjoy and prefer this mode of learning, but still the majority would prefer either a combination of online and face-to-face or just face-to face. Is this due to prior experience or is this a learned behaviour? Or do students genuinely believe that their learning is more effective if they have contact with a *real*, live person? It would be interesting to pursue these questions further and that will be the next stage of this pilot.

However, a possible answer to these questions emerged in the focus group interviews, where it became clear that a weakness in the use of the videos was the lack of interaction with lecturers, the inability to ask questions or clarify what had been presented. This is certainly a weakness of videos, but perhaps some other online tools could assist. Weekly online sessions during which students have the opportunity to chat synchronously online with the lecturer or setting up an asynchronous discussion where questions could be posted and answered in a timely fashion by teaching staff. How successfully these types of support strategies would be used by students would be interesting to determine, as many lecturers experienced in online learning would confirm that not all students participate in online discussions. However as a support mechanism for video lectures they might be an interesting tool to include within the next phase of the pilot.

Conclusion

This paper has presented the results of a small pilot study conducted with students in pre-service teacher education programs. The study sought to accommodate student requests for unit flexibility and presented a blended learning approach. Lectures were presented to students as videos, available online as MP4 or .avi files, and these were supported on the university Moodle site by online quizzes, web links to relevant sites, discussion threads, and electronic documents to assist learning. The technological abilities of the students were self-rated as high, and these assisted in the project being able to focus on the perceived learning outcomes of the pilot rather than being derailed by technology-based problems. It would appear from the data that the students generally found the blended learning approach to be suitable, still preferring some contact with teaching staff, and the online materials needed to be crafted with more opportunities for interactivity and support. The use of videos rather than face-to-face lectures was positive, but the inability to ask questions or clarify content was an issue. This pilot demonstrates that the blended learning approach is appropriate for university; however it requires a high level of support and interactivity if it is to be successful. The results of this pilot will inform the next phase of this project where some of the findings will inform the development of a refined blended learning model. Additional data regarding student frequency of access to the moodle site and the length of time spent on the site on each occasion could provide further insight into the habits of these students.

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Blended learning: What kind of fit for the NetGen?

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Appendix A   Online survey

1. How would you self-rate your level of confidence with technology?

○ Novice – I am a very nervous user of technology

○ Average user – I am reasonably confident

○ Expert – I am a very confident user of technology

○ Other (please specify)

[ ]

2. Were the videos easy-to-use?

○ Yes, I had no problems.

○ Yes, but sometimes I had some difficulties.

○ No, I had many problems.

○ No, I gave up and did not watch any.

3. Did you download them or watch them in LEO?

○ I downloaded them onto my computer/MP4 player (i.e. iPod)

○ I watched them on LEO

○ Other (please specify)

[ ]

4. Which of the following statements describes your typical habits:

○ I watched most of the lecture videos.

○ I watched all of the lecture videos.

○ I watched all of the lecture videos more than once.

○ I did not watch many of the lecture videos.

5. Compared to your normal attendance at face-to-face lectures, did you:

○ Watch more lecture videos than you would have normally attended.

○ Watch less lecture videos than you would have normally attended.

○ Watch the same number of lecture videos as you would have normally attended.

6. As you have now completed this unit – what is your preferred format for lectures?

○ Lecture videos

○ Attending live lectures in a lecture theatre

○ Other (please specify)

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7. How did you use the videos? Select the statement that best matches.

○ I watched the videos, whilst making notes on the Ppt handout or in a notebook.

○ I watched the videos, then looked at the Ppt handout.

○ I watched the videos, but I didn't use the Ppt handout.

○ Other (please specify)

8. How do you think the combination of online lectures (video recordings, quizzes, and discussion threads) and face-to-face tutorials impact on your learning?

○ The combination of online and face-to-face was very effective for my learning.

○ The combination of online and face-to-face was effective for my learning.

○ The combination of online and face-to-face was somewhat effective for my learning.

○ The combination of online and face-to-face was not effective for my learning.

○ Other (please specify)

9. How long have you been studying at university?

○ This is my first year.

○ This is my second year.

○ This is my third year.

○ This is my fourth year.

10. Would you be happy if all of your lectures were presented as video recordings?

○ I would be happy if all of my lectures were presented as videos.

○ I would prefer a mix of live lectures and videos.

○ I would be happy if all of my lectures were live.

○ Other (please specify)

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Appendix B   Focus group interview questions

1. What specifically were the advantages of lectures being delivered as videos?

2. What specifically were the disadvantages of lectures being delivered as videos?

3. Did you feel that your learning was more effective using lecture videos as opposed to sitting in a lecture theatre listening to a lecture?

4. Do you feel that you received value for money from this unit? Or did the video recorded lectures have no bearing on this?