Using Podcasts/Audio Downloads and an Electronic Voting System to Transform a Traditionally Delivered Module Into a Blended Learning Module.

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Abstract: At the authors' institution, blended learning is defined as "educational provision where high quality e-learning opportunities and excellent campus-based learning are combined or *blended* in coherent, reflective and innovative ways so that learning is enhanced and choice is increased. Students are at the centre of this vision".

The paper outlines a work in progress that investigates how podcasts, audio file downloads and use of an electronic voting system (EVS) can be used to transform module delivery. The module, has previously been delivered traditionally and has now been evolved into a blended learning module. The purpose is to enhance students' learning and increase flexibility in how, when and where they study. The paper includes the context for the alteration in the structure of the module delivery.

At the current stage a mid-point student evaluation has been undertaken. The final report will include a student evaluation and also staff perspectives of the process. The findings will be of relevance for module/course leaders or tutors, seeking to develop blended learning approaches to module/course delivery. The findings can be used to inform changes in curriculum design and are applicable across a range of disciplines.

Keywords: Blended learning; curriculum design

1. Background – study goals

On flexible learning, Van den Brande (1993) has said:

"There must be more flexibility to meet the needs of the learner, through adaptability to different learner needs, learning patterns and settings, and media combinations".

Collis and Moonen (2001) also state that flexibility can involve options in course resources, in types of learning activities, in media to support learning, and many other possibilities.

The aim of this study is to discover if the students identified the blended learning initiatives as either a complement or a detriment to their perceived learning. In parallel, the perceptions of members of staff on the teaching team are to be explored in terms of module delivery and the level of student engagement with their learning. The intention is to create a blended learning module, which allows some flexibility of learning location and time which will enhance student learning and understanding of the topics taught.

1.1 Previous Delivery Pattern

In previous years the undergraduate level two module 'Pathology for Imaging' had been taught during two two-hour lecture type sessions delivered in the morning and afternoon of the same day (timetabled on a Monday). The module offers achievement of thirty credits points (15 ECTS points), and in the researchers institution accounts for three hundred hours of effort by the average student. The module aims to move the student forward from understanding of the healthy human body to understanding how disturbance of homeostasis caused naturally by aging and human development, by illness or by trauma, will affect the individual and be manifested on the resultant image.

1.2 Student Cohort

The student sample for the project consisted of 120 undergraduate students enrolled on a module titled "Pathologies for Imaging". This is a level 2 undergraduate module, forming part of a BSc (Hons) Diagnostic Radiography and Imaging programme.

In the experience of the authors, increasing student numbers and widening access has led to very diverse student cohorts, with a wide range of abilities and learning needs. This has led to the authors questioning the validity of the traditional lecture driven format. The student group is diverse in terms of geographical location, ethnic origin and background, and age with 35% of students being mature students. Many students also have considerable responsibilities to bear in addition to their academic studies. Some students have families or care for elderly relatives, and many also have part-time jobs to help fund their academic studies.

1.3 Use of traditional lectures

Many writers have taken issue with the use of lectures. Laurillard (1993) has said that perhaps lectures were defensible in the old university systems of selection of students on the basis of standardized entrance examinations. Today the more open access and modular courses make it unlikely that a class of students will be sufficiently similar in background and capabilities to make lectures workable as a principal teaching method. Brown and Race (2002) have added that despite the advent of readily available electronic means of delivery, lecturing is still seen by many as the most cost-effective means of delivering content in higher education. Therefore the module leader made the decision to reduce the number and frequency of lectures, in favour of podcasts and audio downloads supplemented by small group seminars.

2. Introduction of Blended Learning initiatives - background

The use of blended learning techniques takes advantage of the variety of learning experiences that can be offered by the use of a mix of learning environments (Reid-Young, 2003). At the authors institution, blended learning has been defined thus:

"A cornerstone of our strategic vision is educational provision where high quality e-learning opportunities and excellent campus-based learning are combined or blended in coherent, reflective and innovative ways so that learning is enhanced and choice is increased. This is our view of Blended Learning (BL) and our students are at the centre of this vision."
University of Hertfordshire Blended Learning Unit (2007)

Contrary to the notion that education technology encourages campus based institutions to deliver more of their provision at a distance, research literature suggests that educational technology can have the effect of drawing staff and students closer together, both physically and virtually (Cairncross, 1997; Graetz and Goliber, 2002).

2.1. Module delivery

The initiatives of audio download files/podcasting and the use of an electronic voting system (EVS) were introduced into the module at the start of the current academic year.

The initial lectures that would have been used to introduce topic areas, were developed to be delivered electronically via the University's managed learning environment (MLE) as PowerPoint™ presentations which are accompanied by audio download files. These could also be accessed as stand alone podcasts. This was to give students the opportunity to access and use the resources at a time and place convenient to themselves as identified by Motteram (2006). These resources were designed to be used to undertake necessary preparatory background learning. The afternoon teaching session which followed was then delivered as small group seminars using activities and games which were designed to enhance and reinforce the learning.

2.2 The podcast design

It was recognised that the module involved introducing a large amount of new vocabulary and concepts. This was identified as a challenge to learning because it was thought that in large groups students are less likely to ask questions. There is then a risk of losing some students' engagement and therefore their understanding. One of the initial slides in each presentation was a list of terms and concepts that may be new to the student. The next slide gave an overview of the topic, introducing relevant concepts to be studied, some of which would be new to the student. At this stage the recording was stopped and the students advised to take a break. The idea behind this was that they would have the opportunity to look up and learn new words and concepts that they would need to apply during the rest of the audio download file/podcast. This would help the students sequential understanding of the material contained within the audio download file/podcast.

During the rest of the podcast images are presented along side the audio file to allow the students to identify the appearance of abnormalities with reference to background information. Both the audio download file/podcast and accompanying PowerPoint™ presentation are divided into 'chunks' generally lasting between twenty to thirty minutes. At the end of each chunk the content is summarised, the students are encouraged to take a break from studying, and when refreshed review any areas of the presentation where they felt their understanding was not complete.

2.3 Method of producing the audio download files/podcasts

Podcasting may be viewed as personalised on-demand multi-media content that is distributed to a subscriber's computer via the Real Simple Syndication (RSS) protocol (Laing et al, 2006). The audio download files were recorded using a digital voice recorder (DVR) which was capable of recording directly as an mp3 file format.

The audio recordings were all made without editing and corresponding directly to the accompanying prepared PowerPoint™ presentation (each slide was numbered to allow student and researcher to be sure of the content being discussed). The opportunity was taken to suggest that the students reviewed their own knowledge as they listened to the podcast. The researcher posed questions to the students across the audio file. Suggestions were made when discussing challenging topics as to what steps a student could take in areas where their understanding was less than complete. Examples include suggesting relevant topics the student could usefully review in order to enhance their knowledge and understanding. Additionally, during some podcasts preparatory work for the afternoon seminar was suggested, such as preparing an outline answer or drawings to a posed question for discussion.

On completion of recording the DVR was connected to a computer and saved as an mp3 file. It was then easy to upload the mp3 file to the module website as a podcast, linking it to the prepared PowerPoint™ presentation under "teaching resources". Educause (2005) have stated that "podcasting allows students to use their technology-based entertainment systems (iPods, MP3 players) for educational experiences". Educause (2005) also suggest that podcasting broadens educational options in a nonthreatening and easily accessible manner because, students are already familiar with the underlying technology. However the authors were uncertain that the sample student cohort were all familiar with the underlying technology, and this was one area appropriate for investigation.

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2.4 Using the electronic voting system

EVSs typically comprise four primary elements: a tool for presenting lecture content and questions (e.g. a computer, PowerPoint™ and a digital projector), electronic handsets that enable students to respond to a lecturer's questions, receivers that capture students' individual responses and EVS software that collates and presents students' responses (Kennedy and Cutts, 2005). The use of electronic voting systems (EVSs) has been reported by Kennedy and Cutts (2005) as becoming more widespread in higher education.

During the sessions, one of the activities involved the lecturer presenting a multiple choice questionnaire (MCQ) based upon the current topic. Students are asked to respond to the questions using EVS handsets. Feedback on the learning process was then available to both students and staff (Kennedy and Cutts, 2005), and the lecturer was able to provide instant feedback and address any misunderstandings or misconceptions.

Part of the assessment for the module is a multiple choice examination. The use of EVSs as a tool to support exam preparation has been documented. Draper and Brown (2004) have outlined the use of EVSs to give medical students practice on a multiple choice questionnaire (MCQ) format exam. Within this module, the questions used in the MCQ were similar in nature to those to be found on the summative MCQ exam. It was thought that the EVS was particularly suited to the needs of the student with regard to the method of summative assessment (Kerres & DeWitt in Boyle, 2005).

3. Method of evaluation

The study employs a quantitative paradigm to investigate the perceived effects of the blended learning initiatives.(Robson, 1993, Polit & Hungler 1997). Reviewed literature was used to inform the choice of data collection (Walton et al, 2005, Ausburn, 2004). It was decided to conduct a survey in order to collect perceptions of students and staff to examine the impact of the blended learning initiatives. Data collection was conducted by means of questionnaire. The research was considered by a Local Research Ethics Committee (LREC) to ensure the research complied with institutional standards.

3.1 Student questionniare

Two surveys have been written, one for the students and one for the staff. Students are to be recruited on a voluntary basis and the questionnaire is to be administered at the end of a teaching session. The covering letter attached to the questionnaire stated that 'by returning the questionnaire consent is assumed'. The questionnaire was structured around the identified technologies of podcasting and electronic voting systems.

On podcasting the focus was primarily on the effectiveness of the podcasts in terms of accessibility. The students were asked to specify how long they spent studying with the podcast so that comparisons could be made to the previous traditional two- hour lecture. It was thought relevant to attempt to establish how many times the students listened to the audio file, and where and when they accessed them to establish to how much the students were utilising the flexibility of the initiative. The focus of the questions regarding the electronic voting system was to attempt to quantify how much the students identified the EVS as an effective learning tool.

3.2 Staff questionnaire

In the researchers institution modules are taught by teaching teams under the guidance of a module leader. An important facet of the research was to investigate the staff perceptions of the blended learning initiatives It was identified that the teaching staff would be in an informed position to identify possible challenges and areas for future development. The small number of staff on the teaching team would make maintaining confidentiality problematic. This may lead to bias in the answers received. The decision was made to send the staff questionnaire to each individual via electronic means allowing them to complete the questions electronically. They could then return hard copy to the researchers, who would then be unable to identify the source. The focus of the questions to the staff was on the appropriateness of the technologies as learning tools and on the perceived level of student engagement.

3.3 Interim results

The module in which this project is being carried out is taught over 2 semesters. Although this paper currently represents work in progress, an informal evaluation was undertaken at the midpoint of the taught sessions. Because successful achievement of the module is equal to 25% of the whole academic year it was thought important to assess the extent to which the students were engaging with the module. The researcher was mindful that some students could be finding the blended learning initiatives challenging to engage with. It was recognised that this could have the effect of prejudicing their opportunities for success across the academic year. An evaluation was performed after seven weeks of delivery. From verbal feedback received the podcasts rather than the EVS would be the perceived source of challenge and so the EVS was used for evaluation during one seminar session. The distinct advantage of this method was the anonymity afforded by the EVS. It is recognised that using EVS to evaluate blended learning technologies may incur bias. The primary purpose of the interim evaluation was to determine whether continuing with the blended learning technologies was in the best interests of the students. The final evaluation of the learning technologies within the module will be performed by different methods and therefore it is perceived that the final results will be both valid and reliable.

The evaluation was performed using five MCQs and the EVS, see table 1 below.

Question	Agree strongly	Agree	Disagree	Disagree strongly
I have found the audio files a good way to learn	53.2	12.9	8.1	3.2
I would rather have the Monday morning lecture than the audio file	3.2	8.1	16.1	56.5
I feel that the small group sessions help to reinforce my learning	46.8	25.8	1.6	1.6
I would rather have 2 lectures than the current pattern of teaching	6.5	4.8	12.9	59.7
I think the module should continue in its current format	56.5	21.0	3.2	

Table 1. Student responses to the MCQ evaluation.

In response to the question "I have found the audio files a good way to learn" 66.1% of the student group either agreed or strongly agreed with the statement. See figure 1 below.
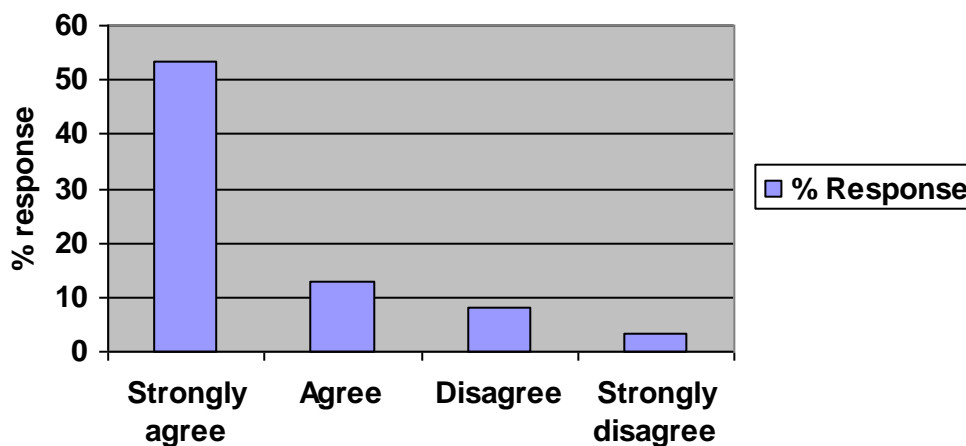

Figure 1. Responses to the question "I have found the audio files a good way to learn".

In response to the question "I would rather have the Monday morning lecture than the audio file" 72.6% of the student group disagreed or strongly disagreed with the statement. See figure 2 below.
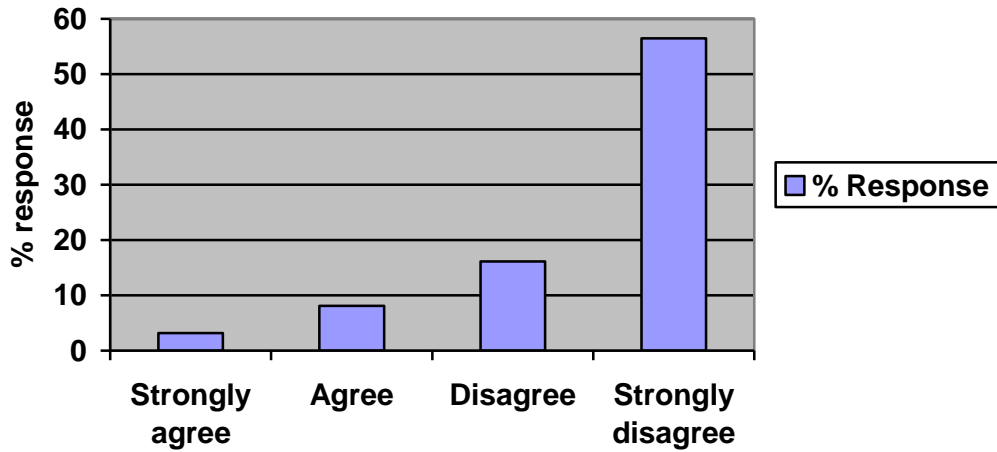

Figure 2. Responses to the question "I would rather have the Monday morning lecture than the audio file".

In response to the question "I feel that the small group sessions help to reinforce my learning" 72.6% of the student group either agreed or strongly agreed with the statement. See figure 3 below.
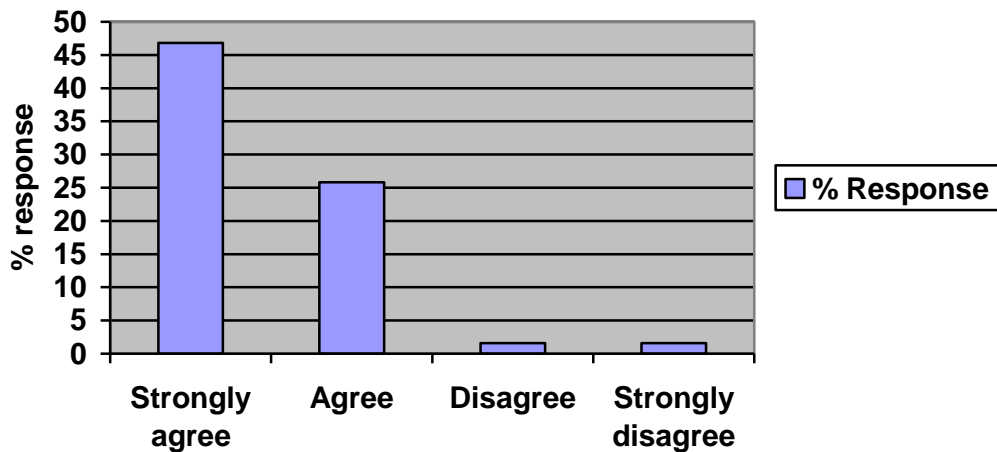

Figure 3. Responses to the question "I feel that the small group sessions help to reinforce my learning".

In response to the question "I would rather have 2 lectures than the current pattern of teaching" 72.6% of the student group disagreed or strongly disagreed with the statement. See figure 4 below.
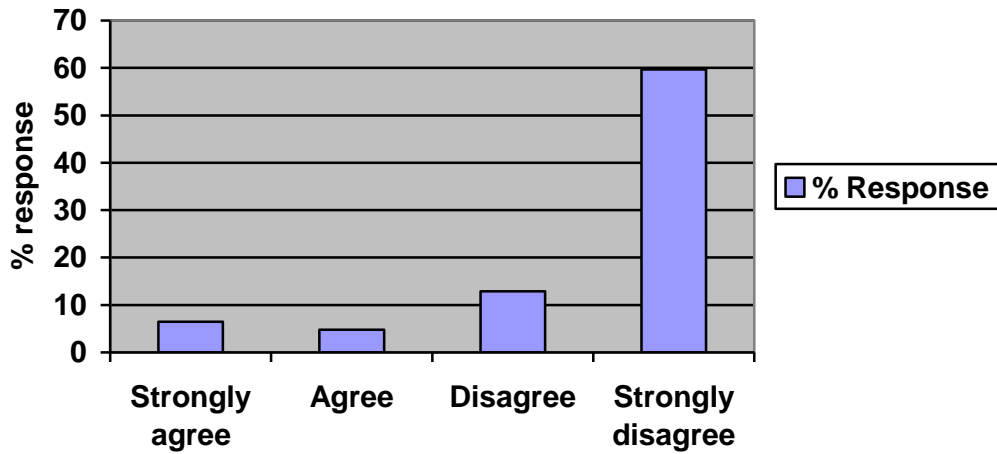

Figure 4. Responses to the question "I would rather have 2 lectures than the current pattern of teaching".

In response to the question "I think the module should continue in its current format" 77.5% of the student group either agreed or strongly agreed with the statement. See figure 5 below.
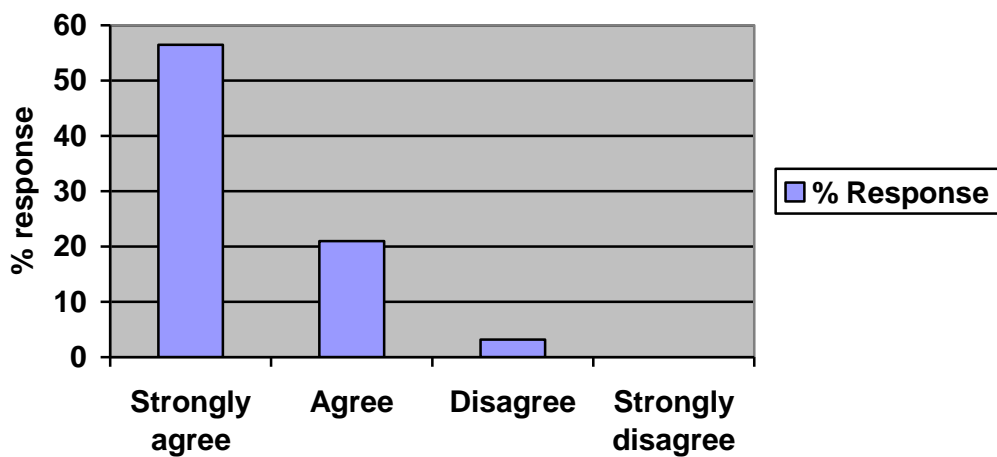

Figure 5. Responses to the question "I think the module should continue in its current format".

4. Discussion of interim results

The results were so definitely in favour of the blended learning initiatives researcher has continued to use them in the module delivery. It is possible the timing of the evaluation was influential in the results obtained. Difficulties were experienced by some students, staff and the researcher within the first few weeks of delivery and many of these had been resolved by the time of the evaluation exercise. It is relevant to note that the module is delivered on a Monday. The pod cast sessions took the place of the morning session, enabling the students not to attend the university on a morning when travelling, parking etc tend to be at their worst.

The strongest agreement for the pattern of delivery was for the use of small group sessions. This reinforces the researchers beliefs that small group work enhances learning, and that with cohorts of over 100 students delivery patterns should be sufficiently adaptable so that small group work does not become lost. The researchers are confident are the described combination of teaching delivery methods are a successful way of allowing small group work to continues with large cohorts.

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