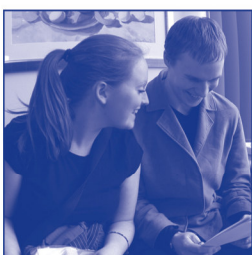
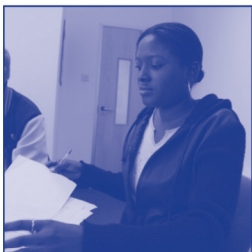
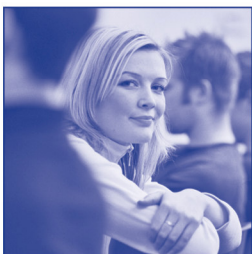


Health Sciences and Practice Mini Project

How do diverse groups of learners in the health sciences respond to a new virtual learning environment?

January 2006

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Queen Margaret University College

EDINBURGH

Final report for LTSN Health Sciences

How do diverse groups of learners in the health sciences respond to a new virtual learning environment?

Miniproject: phase 4

Funded by the Learning Teaching Support Network for Health Sciences

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BACKGROUND TO THE STUDY

In summer 2002, the Learning Teaching Support Network for Health Sciences confirmed funding for the mini-project to explore the question:

How do diverse groups of learners in the health sciences respond to a new virtual learning experience?

(see Appendix 1 for the final proposal). The case study, involving two physiotherapy modules, began in September 2003 and by May 2004 all data had been collected. Between June 2003 and June 2005, the data was analysed and a literature review undertaken. This report provides an overview of the project including:

- An in-depth literature review of e-learning including Virtual Learning Environment (VLEs)
- An overview of the methodology chosen for the study
- A results and discussion section.

It is anticipated that the core findings of this project will shortly be submitted for publication to the journal *Physiotherapy* as part of the dissemination of the project.

Aims of the project

In the original proposal, the stated aims of this research were to:

- 'Investigate learners' responses to their first exposure to a new learning experience in a VLE
- Examine learners' attitudes to the VLE as an effective learning environment through the project
- Compare and contrast attitudes to a VLE in two different physiotherapy programmes.'

Objectives of the project

The main objective of the research (as stated in the original proposal) was to provide a detailed analysis into the experience of two specific and differing physiotherapy student cohorts who were new to using VLEs in the learning experience. We aimed to:

- 'Provide an overview of the literature on the use and value of VLEs in the health sciences. This will focus specifically on initial learner attitudes to Information Technology in learning
- Conduct a study exploring students' reactions to, and participation in a VLE during the lifetime of the project
- Identify issues in preparing students in the use of a VLE drawn from diverse groups
- Evaluate the findings of the study which will:
 - Review students attitudes to the use of a VLE in physiotherapy programmes
 - Highlight individual, social and technical barriers for the meaningful implementation of the VLE from the student perspective
 - Consider the potential for VLEs for the health science community as a whole as well as to the individual lecturer
 - Raise awareness, throughout the duration of the project, of the potential roles of VLE in improving students learning.'

‘E’ in the learning environment

At the time of the proposal submission, VLEs were being introduced across the tertiary sector in the United Kingdom. For example, a study undertaken in 2002 for the Joint Information Systems Committee (JISC, 2002) indicates a high take-up of VLEs in all types of institutions surveyed (including further and higher education). 85% of FE colleges, 84% of pre-1992 universities and 97% of post-1992 universities who responded to the survey had at least one type of VLE. This included all subject areas. From 2002 the term e-learning was being widely used and many of the subsequent articles which have formed the basis of our literature review refer to e-learning which often involve the use of a VLE in the learning environment.

Several key publications regarding e-learning, including the use of VLEs, have emerged in the timeframe of this project. For example, policy documents from the English, Welsh and Scottish governments have been published. The ‘HEFCE Strategy for e-learning’ (2005) has placed the role of learning with technology in higher education centre stage. This strategy aims:

“to support the HE sector as it moves towards embedding e-learning appropriately, using technology to transform higher education into a more student-focused and flexible system as part of lifelong learning for all who can benefit.” (HEFCE 2005 p5.).

This has been supported with additional funding for the sector in deploying e-learning. The Department for Education and Skills’ report: ‘Harnessing Technology’ provides a blueprint for e-learning in schools and further education. Whilst in Scotland, SHEFC (2005) has published a ‘Training Needs Analysis’ for the future deployment of e-learning in higher education. Specific projects have also emerged focussing on the student experience, for example, the SOLE (Student Online Learning Experiences) project (2004). This undertook an evaluation of students’ usage of VLEs in higher and further education. It aimed to examine the effectiveness of VLEs in supporting different subject areas, different national agendas (such as that of widening participation) and student learning in general. Several publications produced by this project are referenced in this report especially the work of Timmis and O’Leary (2004). Numerous case studies have appeared describing the use of e-learning in the health sciences and again these are referred to throughout the report as well as appropriate ones from other subject disciplines, for example, Hospitality and Tourism.

E-learning is now an accepted term used within the tertiary education sector. VLEs are included within this term and generally refer to one program, for example, Blackboard or WebCT, which encompasses a range of online learning tools, for instance, calendar, discussions (synchronous and asynchronous) as well as provides areas where students can access content. This project has focussed on the deployment of an institutional VLE (WebCT) for two student cohorts. The findings in some cases relate specifically to VLEs whilst others apply to the general use of technology in the learning environment.

LITERATURE REVIEW

Previously in the health sciences, students studied to become a professional in their field which required them to acquire a specific knowledge and skills base. Now the nature of professional work is changing and as a consequence, students are also required to develop different skills to enable lifelong learning in order to work and respond to the demands of evidence-based practise.

“Throughout the industrial era, the system [has] focused upon serving the educational needs of youth to prepare for a lifetime of work.”

(Hanna 1998).

but now we are living in the age of the knowledge worker and the lifelong learner. Consequently, many of our students wish to study flexibly, in surroundings and at times that suit them (Medlin et al 2004; Jones and Griffiths 2003) and may be returning to learning after some years away from studying in a traditional academic environment. In many cases, the institutional response to these pressures has been to introduce e-learning often in the form of a VLE. This has the added benefit for onsite students who are able to access lecture notes, handouts and resources away from the classroom. Students are also able to contact other students without necessarily having to be in the same place at the same time. The deployment of e-learning is often linked to encouraging students to take more responsibility for their own learning in order to become independent learners. This shift is, perhaps, even more relevant in the area of educating health professionals, who are often employed while they learn or need to spend periods on placement in the field away from the academic institution. E-learning has also been seen as a way in which lecturers can more easily service the needs of ever-increasing student numbers (Medlin et al, 2004), as well as coping with administrative demands and retaining their research. Some have even suggested that e-learning may provide a partial solution to the issue of providing public education with dwindling resources (Daniel 1997).

There is already a large and developing body of literature on the design and development of e-learning programmes and online experiences for students (Stephenson 2001; Steeples & Jones 2002). There is also extensive literature on techniques for tutorial assistance and support for students (Salmon 2000; Salmon 2002; Harvey & Moge 1996). However, literature focussing specifically on student perceptions of their e-learning experience has only emerged in the last few years especially in the area of education of health professionals, who have come late to distance learning, and often even later to the use of e-learning (Mattheos *et al* 2001). Nevertheless, a number of trends appear from this relatively small collection of materials. These trends seem more evident in groupings of students which reflect a more diverse rather than homogenous student body. Before discussing these different groups, some research from the United States proposes a new generation of students.

A new generation of students

Oblinger (2003) considers a new type of student as ‘generation X’ or ‘new age learners’ and describes some of the characteristics of this group (citing the work of Frand 2000) which are different to traditional perspectives on students (see Table 1 for details). For example, this group of students gravitates towards groupwork and expects to be in almost constant contact with their peers. If the description of technology as provided by Oblinger (2003) (see Table 1) is accepted then today’s student does not consider that computers, or even mobile phones are technology - they are part of the way the world is configured and to be used in daily life with the same casual acceptance that most of us in the developed world would assign to the radio or television.

Computers aren't technology	If you can remember the first time that you used a piece of technology, for example, the Internet, then it is technology. For most of our students, using a computer is not technology; it is just part of life. It is therefore not surprising that the SEUISS Report (2003) shows high level of social and recreational use of technology in new and continuing students at university.
Internet better than TV	For the first time, since television was introduced, the number of hours that young people spend watching TV has been reduced and replaced with time online. Students are now using the Internet for everything and often believe that everything is available on the Internet.
Reality no longer real	Through photography, we began to believe what we saw. However, with digital manipulation of images, hoax emails can we believe what we see? How accurate is the information online. Today's students need to be critical of the information that is provided to them via the Internet.
Doing rather than knowing	In the past, the shelf life of information would be decades, if not centuries. Now, due to technology, it is measured in months and, sometimes, years. This changes students' attitudes and perceptions of information. Doing and obtaining results are seen as more important than knowing information which will be out of date in a few years or even months.
Nintendo over logic	The quickest way to win a Nintendo game is to try and try again: trial and error. If there is a problem, the computer can be rebooted. Students use this approach to learning which contrasts vividly with the more traditional, rule-based approach to solving problems. We need to consider the benefits and disadvantages to ensure that we can accommodate all learning styles through our use of technology in education.
Multitasking as a way of life	Most students are comfortable listening to music, answering an email, talking on the phone and surfing the web simultaneously. Learning with technology will just be one activity that our students will be engaging with. How will this affect the way as tutors we present information especially in the VLE?
Typing rather than handwriting	Most students are more familiar with the keyboard than pens. The digital word can be manipulated easier than paper and re-used and recycled.
Staying connected	Students want to stay in touch - wherever, whenever. They have phones, PDAs (Personal Digital Assistants) and beepers. For learning this means these students do not need or want to be constrained by the physical location of education.
Zero tolerance for delays	Our students have grown up in a 24 x 7 culture, customer-service culture. They are used to immediacy. Emails allow students to contact tutors but imply an expected short response time.
Consumer/creator blurring	The web has made it easier to create information and make it available. It has also made it easier to access information. For many students, there is now a blurring of creator, user and owner of information.

Table 1: Frand's (2000) 10 characteristics of an information age mindset learner as cited in Oblinger (2003)

The approach of this group to problem-solving, largely influenced by computer games, is a trial and error approach. This contrasts with the linear sequence – learn the theory, look at the examples, apply the theory – which has been the mainstay of teaching for many years. This viewpoint is confirmed by Aspden et al (2003) who found that students participating in their study were happy with what they call a ‘communal constructivist’ approach: this was very similar to the problem-solving and teamwork trend noted by Oblinger (2003). Frand (2000) takes a slightly less radical view, believing that for these students, a balance needs to be found between didactic and discovery approaches: students expect education to emphasise the process of learning rather than the knowledge itself. He also stresses that students want to be part of a community and expect to keep in contact with that community for learning and social purposes on a level which is very nearly ‘24/7’.

Whilst Oblinger (2003) and Frand’s (2000) discussions are based on American higher education, there is clearly sufficient congruence with the environment in the United Kingdom to note these views as having significant effect on the way that learning and teaching is approached and in particular, e-learning. It should also be noted that computer ownership amongst students in the UK has risen sharply without any university-drive, in most cases, to purchase a computer. For example, in Breen et al’s study (2001) at Oxford Brookes, 42% of first years owned a computer in 1997 rising to 52% in 1999; Haywood et al’s (2004) longitudinal study at Edinburgh University indicates that by 2003 computer ownership had risen to over 70% with over 50% of these owning laptops.

Beyond this new, emerging group of students, there are groupings which are largely in contrast to each other in the literature. They are:

- Undergraduate and postgraduate students
- Onsite and offsite students.

Whilst it may be tempting to see age as a critical factor in this discussion, and indeed there are some age differences, these groupings are far more important and seem, in many cases, to transcend that of age.

Undergraduate and postgraduate students

The primary motivation for undergraduate students appears to be that of assessment and completion of programme. These students are not necessarily intrinsically motivated to study but need the ‘push’ of extrinsic motivation (Knowles 1984). This can make it difficult for them to study in an online environment where they do not have the discipline of lectures and face-to-face contact to keep them moving through the programme to completion. An online environment favours those students who are self-directed (Howland and Moore 2002; Carroll-Barefield and Murdock 2004). Oliver and Omari (2001) found that whilst many undergraduate students saw the benefit of student-centred and collaborative learning in a theoretical sense, they preferred to learn in a more conventional, teacher-directed environment. Oliver and Omari (2001) posit that these learners were uncertain of strategies for directing their own learning and for this reason found it difficult to organise themselves properly for, and therefore gain real advantages from, group working.

Postgraduate students tend to be more motivated by intrinsic factors to complete their studies. By and large, they are extending their learning voluntarily. Therefore they tend not to be as focused on assessment as undergraduate students are and will engage in ‘extra’ work for the sake of the knowledge and the learning experience themselves. These students are excited by the possibility of accessing a wide range of information, although they are aware that the Internet has its own problems in terms of credibility (Monteith and Smith 2001).

Such students are usually balancing a wide range of responsibilities compared to undergraduate students, for example, working, fulfilling family responsibilities as well as studying. This is possibly even truer of health professionals who may also have to deal with antisocial hours and unusual patterns of working (Swisher and Mandich 2002). Such students value the flexibility of the e-learning environment above all (Richardson 2004). In Daugherty and Funcke's (1998) research, for instance, postgraduate students constantly used the phrase 'time-saver' in describing their experiences. These students also liked the self-paced nature of the web-based materials they used, one student even commenting that the format worked well for 'self-motivated, mature students' (Daugherty and Funcke's (1998).

Postgraduate students can, however, be critical of some features of the online learning experience. For instance, one group of postgraduate students described student-led tutorial sessions as 'the blind leading the blind', in contrast with undergraduate students who did not have a problem with this format (Mattheos *et al* 2001), provided it is well guided.

Onsite and offsite students

Generally, onsite students work in a social and communal environment. It is also an environment which functions primarily traditionally and conforms to their expectations of how learning in a university environment will be. The introduction of e-learning into this environment does not fit well with their expectations of the learning experience. Many students find this disconcerting and, as Breen *et al* (2000) note, they feel that any mass education systems and ICT-based experiences will threaten valued teacher-student and student-student interaction. Indeed, some students may go so far as interpreting the need for self-responsibility as abandonment by the lecturer and feel isolated (Howland and Moore 2002). Consequently, they may resist all attempts by the tutor to involve them in any opportunities for knowledge construction and prefer the traditional format of receiving information from the tutor (Alexander 2001). As Crook states:

“... young people who have recently left school – [is] are unlikely to be easily seduced by the prospect of independent learning that is decoupled from the bricks-and-mortar world of institutional learning.” (Crook 2002, p.301).

Nevertheless students in a primarily face-to-face environment find it extremely useful to have material presented on the VLE in the same sort of timeframe as their lectures take place, and indeed value very highly the electronic presentation of lecture notes on the VLE (Conrad 2002, Williams 2001). Saunders and Klemming (2003) confirm that students felt the availability of online materials helped them to develop an overview of what to expect in class and tended to increase their chances of understanding topics in class. Onsite students are more likely to site print as the medium of choice than offsite students (Armatas *et al* 2003).

Onsite students, particularly, are wary, and even resentful, of online discussions, which may seem unnecessary given the amount of face-to-face contact they have with their peers and tutors and consequently find it difficult to see the point beyond an extra burden of work (Monteith & Smith 2001). This finding is confirmed by Timmis and O'Leary (2004) who note that students failed to see the relevance or benefit of online discussion for a traditional on-campus programme. In addition, in a face-to-face environment, contact with peers and tutors outside of formal lectures, can be unstructured and serendipitous as opposed to the more formal environment of the online discussions in a VLE.

These students are again motivated primarily by assessment and will, therefore, participate in those parts of the project that are directly assessed, or which are perceived as being beneficial in terms of assessment. As noted by Crook (2002), while institutions see students as being usefully engaged in study to reinforce the teaching they receive, the actual fact is that they are often preoccupied with completing assessed pieces of work. Saunders and Klemming (2003) found that the students in their study did not use multi-media tutorials and short-answer tests during the semester; they only used these and other materials available when they were necessary to help with completing assignment work. Furthermore, it has been suggested from research that onsite students are motivated by new and innovative presentation media, particularly where they have to interact with it. The trick to keeping these students interested would, therefore, appear to be developing a string of strategies that ensures that the novelty does not wear off (De Lange et al 2002).

In contrast, offsite students, whilst they would generally prefer face-to-face contact (Vrasidas and Mclsaac 2000) value the communication opportunities provided by e-learning. These are opportunities to exchange ideas and feel part of a learning community that they would otherwise not be able to do. Offsite students tend to see discussion postings as useful input to their studies and also seem more willing to engage in extra reading and the use of additional resources (Armatas *et al* 2003). They are also more willing to engage throughout the semester rather than towards the assessment period. For example, Leasure et al (2000) reported that nursing students in a web-based course would engage with the online discussions on a weekly basis. In comparison, students in the face-to-face programme would attend weekly lectures and then focus on the assessment a few days before submission dates. Leasure et al (2000) posit that the regular contact with course materials online may have increased motivation and grades. For offsite students, one of the features of online learning found most valuable, was remote (offsite) access to library facilities: this was particularly noted by Pelletier (2002) whose study was based on nurses accessing learning programmes from a distance and Young et al's (1999) study of an off-campus degree in health promotion.

General issues

A number of general issues have also begun to emerge from the literature which will impact on student attitudes to e-learning regardless of their grouping:

- Technology in the learning environment
- Communicating online
- Demands on resources
- Shifting roles of the tutor and student.

Technology in the learning environment

Almost every case study relating to e-learning mentions problems of access to computers, reliability of computer hardware and/or software and speed of access to the Internet, for example, Crook 2002, Armatas et al 2003, Swisher and Mandich 2002, Williams 2001, Williams 2002, McGorry 2002, Atack and Rankin 2002 and Breen et al, 2001. There are some indications that this may be even more relevant in the health arena where staff are often working on hospital or other medical sites. In such cases the limited number of computers that are available for clinical staff are often being used for more pressing needs such as patient records or prescribing. In addition, resourcing will not allow for state of the art hardware and software. At home, access to computers may also be limited for these students since they have to share the family computer (Atack and Rankin 2002; Simons et al 2001).

Students' confidence in using IT in the United Kingdom in learning is less clear and more complex. Many students (of all ages) express their nervousness at how ill-prepared they perceive themselves to be to learn using computer technology (Breen et al 2001; Hughes & Daykin 2002). However, Haywood et al's study (2004) indicates that new students to Edinburgh University generally felt confident about using IT. In addition, there may also be some differences in subject areas, for example, Pelletier (2002) states that nurses are mistrustful of technology. Interestingly, however, Armatas (2003) found that older students liked working with computers more than younger ones and judged them to be more useful than did the younger ones. Daley et al (2001) discovered that students' attitudes to technology can influence their learning. For example, time delays in response to online discussions could be viewed positively (an opportunity for reflection) or negatively (time-consuming). Several case studies cite examples of students who state that one of the key outcomes of studying online has been increased confidence in their ability in learning using the technology (Grattan et al 1998; Richardson 2004).

Communicating online

Numerous articles provide case studies describing the use of online communication: its role, function, opportunities and challenges. In general, the advantages of online communication focus on the level, type and amount of responses provided by students. For example, studies have shown increased levels of active participation with a programme especially from quieter students than in face-to-face class discussions (Larson and Keiper 2002; Richardson 2004). It has also been found that many students value asynchronous discussion opportunities because they feel they can craft their responses in a way that is not possible in face-to-face discussion (Richardson 2004; Williams 2002). Connor's (2003) health and social care professional students felt that the asynchronous nature of much of their communication allowed them time to think and reflect. This is a finding which is reinforced in Lockyer et al's study (1999) which was also amongst health education professionals. It would also seem that online discussions, in some cases, can encourage critical thinking as students pose questions, explore and engage in dialogue (Connor 2003). More student-to-student participation may also lead to higher levels of perceived learning (Larson and Keiper 2002)

“The students participating in online learning showed growth, insight and passion as they discussed and shared their experiences.” (Gallew 2004 p.124).

Other advantages cite the role of the online discussions in creating a sense of community, for example, in Richardson's study:

“The online technology proved to be an effective vehicle for the students to develop collegial relationships with classmates and instructors.” (Richardson 2004 p.11).

Criticisms of online communication from students include lack of spontaneity, formality, lack of visual cues (Atack and Rankin 2001), the sole use of text, permanence of messages and slow discussion speed (Crook 2002). Students can often be frustrated with other students who do not actively participate in the online discussions, for example, Muirhead's (1999) students believed that their learning was influenced negatively by other students not contributing. Conversations can also be rather stilted with students prefer to direct their messages to the tutor rather than other students (Hughes and Daykin 2002).

This tension in online discussions is exemplified through chat: synchronous online discussions. Such discussions can help overcome some of the disadvantages of asynchronous discussions, for example, by providing opportunities for spontaneity and feedback. However, they can be difficult to organise (Carroll-Banefield, 2004) and can create different barriers and may, as a result, be disempowering for students. For example, Zafeiriou and Nunes' (2001) study using synchronous chat sessions demonstrated that the ability to type was a potential barrier: everyone in the group needed

to have similar ability (either fast or slow) so that no students dominated the discussion and thus no students were disenfranchised. Furthermore, in Jedicka et al's study (2002) students were further frustrated by the synchronous online tool: chat due to technical delays.

Resources

Once students are involved in online learning, they may become very demanding on tutors and support staff. Having shifted out of a mode in which there are set boundaries and timings for things, they perceive that everything should be instantly and constantly available (as predicted by Oblinger (2003) and Frand (2000)). For example, as Breen *et al* (2001) point out, students understand and accept that a book is out of the library and they will have to wait for it, however, they are not as understanding about access to a computer in a computer lab. This extends to the level of support they expect, for instance, such students can be annoyed when tutors are not available '24/7' unless clear guidelines are set up for students to ensure more realistic expectations (Oblinger 2003, Howland and Moore 2002). This issue of transparency applies in other areas, for example, the level of IT support that is available (McGorry 2002).

Additional resources may also be required at the induction process of a new programme using e-learning incorporating VLEs. Generally, students are more prepared to engage with and appreciate the e-learning experience if they are well-informed about why it is being done, what the benefits are, what is expected of them, the tutor role and how they can best do what is required (Moore and Aspden 2004; Howland and Moore 2002; Kubala 1998; Leung and Ivy, 2002). This points to a greater role for induction than might be the case in a traditional environment, where students already have a clear mental picture of what is expected of them and what they expect of the tutors and the institution. Furthermore, in the first few weeks of the programme, additional support will be required to help novice online learners adjust to their new elearning environment (Atack and Rankin 2002) and to ensure that there are introductory activities to encourage active participation in the online learning environment (Ellis and Llewellyn 2004; Salmon 2000).

Time, and particularly lack of time, is another resource referred to throughout the case studies. Students, especially those working in the health arena, cite scarcity of time to commit to their studies as a barrier to learning online (Atack and Rankin 2002). Bee and Usip conclude:

“Possibly little can be done to encourage the World Wide Web's use if the student perceives that he/she does not have enough time to devote to learning via the Internet.” (Bee and Usip 1998, p.258).

Mason (2001, quoted in Alexander 2001) states that, “time is the new distance,” and lack of time is one of the main reasons for students withdrawing from programmes. Exacerbating this issue may be poor information handling skills of students. Students working in the online environment frequently complain about their inability to find the right resource of the appropriate quality (Hayward & Cairns 2001).

“Students are frustrated by how difficult it is to find the precise knowledge they seek on the Internet, and are overwhelmed by the volume of irrelevant material.” (Breen et al 2001 p.108.).

For students who are returning to study and coping with the range and type of learning resources now available, for example, online databases and journals, this may lead to information overload (Bailey et al 2004).

Shifting roles for staff and students

Research indicates that there is a need for tutors and students to adapt their roles away from the transmission role to harness the opportunities for constructive learning provided by e-learning (Timmis and O'Leary 2004). However, the roles of tutors and students themselves are difficult to shift, for example, many students still see the tutor as an authority figure and make only tentative steps to organising their own learning. It is also clearly difficult for tutors to shift their role to a more facilitative 'guide on the side' one and this may even be reflected in the way materials for online study are prepared. For instance, Crook's (2002) study of 71 different course websites found that none of them adopted a conversational manner but took a prescriptive or directive tone. Goodyear (2001) has developed a number of indicators that show how the tutor and student roles might be expected to change when moving into an online environment, such as, a VLE (see Table 2). The classic roles, as pointed out by Timmis and O'Leary (2004), unfortunately, may be perpetuated by the structure of the VLE tools themselves, for example, by not allowing students to create group structures, discussion groups or work areas, but placing that responsibility with the tutor. It would seem that if tutors are to move to a new type of role they will need to engage in, "critical and reflexive thinking about their own practices (ESRC 2002).

From a brief analysis of these case studies, it would seem that further debate on the entire pedagogic model and how (whether) to move it from the acquisition/information-gathering mode to a process of participative learning is needed to bring greater clarity to the roles required of students and tutors with e-learning.

Changing tutor roles
<ul style="list-style-type: none"> • From oracle and lecturer [tutor] to consultant, guide and resource provider;
<ul style="list-style-type: none"> • Teachers become expert questioners rather than providers of answers;
<ul style="list-style-type: none"> • Teachers become designers of learning student experiences rather just providers of content;
<ul style="list-style-type: none"> • Teachers provide only the initial structure to student work, encouraging increasing self-direction;
<ul style="list-style-type: none"> • Teacher presents multiple perspectives on topics, emphasising the salient points;
<ul style="list-style-type: none"> • From a solitary teacher to a member of a learning team (reduces isolation sometimes experienced by teachers);
<ul style="list-style-type: none"> • From total control of the teaching environment to sharing with the student as fellow learner;
<ul style="list-style-type: none"> • More emphasis on sensitivity to learning styles;
<ul style="list-style-type: none"> • Teacher-learner power structures erode.

Changing student roles
<ul style="list-style-type: none"> • From passive receptacles for hand-me-down knowledge to constructors of their own knowledge;
<ul style="list-style-type: none"> • Students move from memorising facts towards solving problems;
<ul style="list-style-type: none"> • Students view topics from multiple perspectives;
<ul style="list-style-type: none"> • Students devise their own questions and search for their own answers;
<ul style="list-style-type: none"> • Students work as group members on more collaborative/co-operative assignments: group interaction significantly increased;
<ul style="list-style-type: none"> • Increased multi-cultural awareness;
<ul style="list-style-type: none"> • Students work towards fluency with the same tools as professionals in their field;
<ul style="list-style-type: none"> • Increased emphasis on students as autonomous, independent, self-motivated managers of their own learning;
<ul style="list-style-type: none"> • Discussion of students' work in the classroom;
<ul style="list-style-type: none"> • There is a change in emphasis from receiving information from the teacher and learning to 'pass the test' towards using knowledge;
<ul style="list-style-type: none"> • Emphasis on developing effective learning strategies (both individually and collaboratively);
<ul style="list-style-type: none"> • Students have greater access to resources.

Table 2: Extract from “Effective networked learning in higher education: notes and guidelines” Goodyear (2001)

THE STUDY

Evidence based practice has emerged as one of the most influential concepts in the health sciences over the past decade. However 'best' evidence is still primarily associated with 'scientific' evidence derived from quantitative research but:

“increasingly it is being recognised that such data may in reality be misleading, reductionist and irrelevant to the real issues” (Greenhalgh, 1997 p.743).

In comparison, qualitative research focuses on the production of subjective data about people's feeling and attitudes to help provide insights about situations that are not sufficiently understood (Hancock 2002). Therefore, qualitative research methods were chosen for this study as this approach addresses questions not readily answered by quantitative methods.

Justification for the chosen methodology

The main aim of the present study was to establish the opinions of two groups of diverse learners (undergraduate and postgraduate physiotherapy students) about using e-learning through a VLE whilst studying modules at QMUC. We wanted to find out the views of the students to enable us to further develop the use of VLEs as part of the learning and teaching environment at the institution: to inform our practice and hopefully those of others. Throughout this project, as stated in the original proposal (see Appendix 1) it has been our overall aim to improve practice rather than produce knowledge (Elliott, 1991): to bring about change and promote reflection amongst practitioners (Middlewood, 1999). We therefore developed a theoretical framework of how knowledge could be developed and how the research study should proceed given the nature of the issues we sought to address:

“Qualitative researchers approach the world with a set of ideas and values, a framework (theory, ontology) that specifies a set of questions (epistemology) that he or she then examines in specific ways (methodology/analysis)” (Denzin and Lincoln, 2000 p.18).

All research including the positivist paradigm followed in quantitative research, is interpretive and makes particular demands on the researcher, including the questions he or she asks and the interpretations the researcher brings to them (Denzin and Lincoln, 2000 p.19). From an ontological standpoint, qualitative researchers believe that there is no single 'reality' to be discovered. Rather there are multiple constructed realities to be understood. Qualitative research is based on an interpretive epistemology, meaning that knowledge is shaped through interaction between those involved in the research process (Carpenter, 2004).

According to Ritchie (2001) p150 as quoted by Carpenter (2004):

“Qualitative research approaches acknowledge the value-laden nature of inquiry and seek meaning and understanding ahead of quantitative measures. They deal with the socially constructed nature of reality, the close relationship (between participants and researcher) and the frequent necessity to investigate without stripping the phenomenon under study of its content.”

In summary different qualitative research approaches share certain characteristics as identified by Hammel and Carpenter (2000) (quoted in Carpenter 2004):

- Research is grounded in people's everyday lives and is an exploration of how people experience and make sense of dimensions (e.g. interventions, events, relationships) of their lives.
- Human behaviour can only be understood in context
- People, including the researcher, perceive and interpret reality differently; there are multiple realities, rather than an 'objective' truth to be discovered
- Research is conducted in a natural setting (as opposed to controlled or laboratory settings)
- The researcher is an integral part of the research process. The issue is not one of minimising the researcher's role but of describing and explaining it fully
- Data analysis is inductive and interpretive
- Data are presented in narrative form with the aim of preserving and representing participants' voices.

Therefore, qualitative research methods were used for the purpose of this study and included individual in-depth interviews, focus groups and the use of questionnaires.

Sample

The sample was one of convenience and drawn from level 1 and master's physiotherapy students and tutors:

Students

The student sample was drawn from two student cohorts studying at QMUC:

1. 49 students (10 male, 39 female) in a BSc (Hons) in Physiotherapy, level 1, studying an 'Introduction to Psychology' module. 46 of these came from within the European Union and three were international students from India, Canada and Bahrain.
2. 10 students (2 male, 8 female) in an MSc in Physiotherapy studying 'Paediatric physiotherapy and occupation therapy: a critical approach.' 7 of these came from within the European Union and three were international students from India and Bahrain.

Tutors

Four tutors were involved in the delivery of the MSc module:

- one, employed by QMUC, was responsible for the administration and organisation of the module
- three part-time visiting lecturers, geographically dispersed across the United Kingdom and working as physiotherapists in the field of paediatrics, who were responsible for the delivery.

The BSc module was delivered by one full-time tutor employed by QMUC. The three postgraduate tutors had never used a VLE (in this case WebCT) before but the undergraduate tutor had some limited experience.

Inclusion criteria

A screening questionnaire for students was not appropriate (Greenbaum 1998) because all of the students enrolled in the two modules were eligible for selection. It had been the intention of the researchers to adopt a purposeful sampling procedure (reflecting for example, use of WebCT, student age and gender as discussed in Bogdan and Biklen, 1992), however, due to practical constraints, the researchers were not able to adjust the sample of the participants in the interviews and the focus groups and therefore the sample

consisted to student who volunteered to attend the interviews and the focus groups. This did have the added benefit that students had the opportunity not to participate and felt little pressure to attend (McDowell and Marples, 2001). No incentives were provided for students to participate in this study as this may have influenced the trustworthiness of the results (McDowell and Marples 2001).

Consent

At the launch of the two modules, students were informed about the project, its focus and aims; this was accompanied by a PowerPoint slide show (see Appendix 3) and an information letter about the project (see Appendix 4). Tutors were present at this presentation to students. If students wished to participate in the project and complete the questionnaires and/or attend interviews and/or focus groups, they were asked to complete appropriate consent forms (see Appendix 5). Tutors were also verbally briefed about the project and asked to sign the appropriate consent form.

Location of the study

The student focus groups and interviews took place on site at QMUC. The tutors reminded the students of the dates for the events and encouraged students to attend. The participants in the focus groups selected their own seats but the moderator was positioned centrally with the researcher in a corner. The undergraduate and postgraduate tutor interviews were either undertaken on site at QMUC or over the telephone. The questionnaires were completed in a class situation with one of the tutors present.

Modules involved in the study: use of the Virtual Learning Environment (WebCT)

Two complimentary physiotherapy programmes at QMUC were involved in the study. In year one of the BSc (Hons) in Physiotherapy, the 'Introduction to Psychology' (Semester 1, weeks 1 –12) module used the VLE (WebCT) with the aim of facilitating peer and independent learning. In this module, WebCT was used to house tutorial, workshop and timetable information which was also provided in paper-format to the students. There were also links to the website for the core text, 'Psychology' by Bernstein, which is published by Houghton Mifflin. This website has online quizzes, experiments, weblinks and summaries of chapters. In addition, each student was asked to work in a pair and to provide a summary of a lecture, workshop or tutorial. This was submitted to the tutor via email for formative assessment prior to being published on the WebCT by the tutor. The students were shown how to use WebCT in late September 2003 and asked to log on to the system and navigate through the materials.

Additionally, a master's module 'Paediatric physiotherapy and occupational therapy: a critical approach' (September 2003 – May 2004) also used the VLE (WebCT). A number of resources were made available through the VLE including online articles via the HERON licensing agreement, study block information (made available online at an appropriate time through the module), a calendar with key dates including assessment hand-in, a list of relevant web links and case study material. Students also used the online discussions to contact the visiting lecturers throughout the module. The tutors posted scenarios and queries to stimulate online dialogue between the students. There was also a student café where students could socialise and provide support and a private facilitator's area where the lecturers could talk online to each other. In addition, the assessment tool was used for formative and Summative assessment. This allowed students to electronically submit their formative assessment and was accessed by the visiting lecture. Marks and comments were sent to the students individually through the tool. Further details about each module are available in Appendix 1 of the interim report, (see Appendix 2).

Procedure

The flowchart (see Figure 3) provides an overview of the iterative procedure carried out during this study. It shows:

- Stage one: the analysis of the qualitative data: focus groups and interviews (with some responses from the questionnaires) to create the seven themes
- Stage two: the analysis (iterative and cross-checked) of the transcripts of the qualitative data using the matrix (see Appendix 11)
- Stage three: the analysis at the postgraduate and undergraduate student groupings
- Stage four: the development of the summaries.
- Limited analysis of ordinal data of student questionnaires was undertaken focussing mainly on additional supportive information.

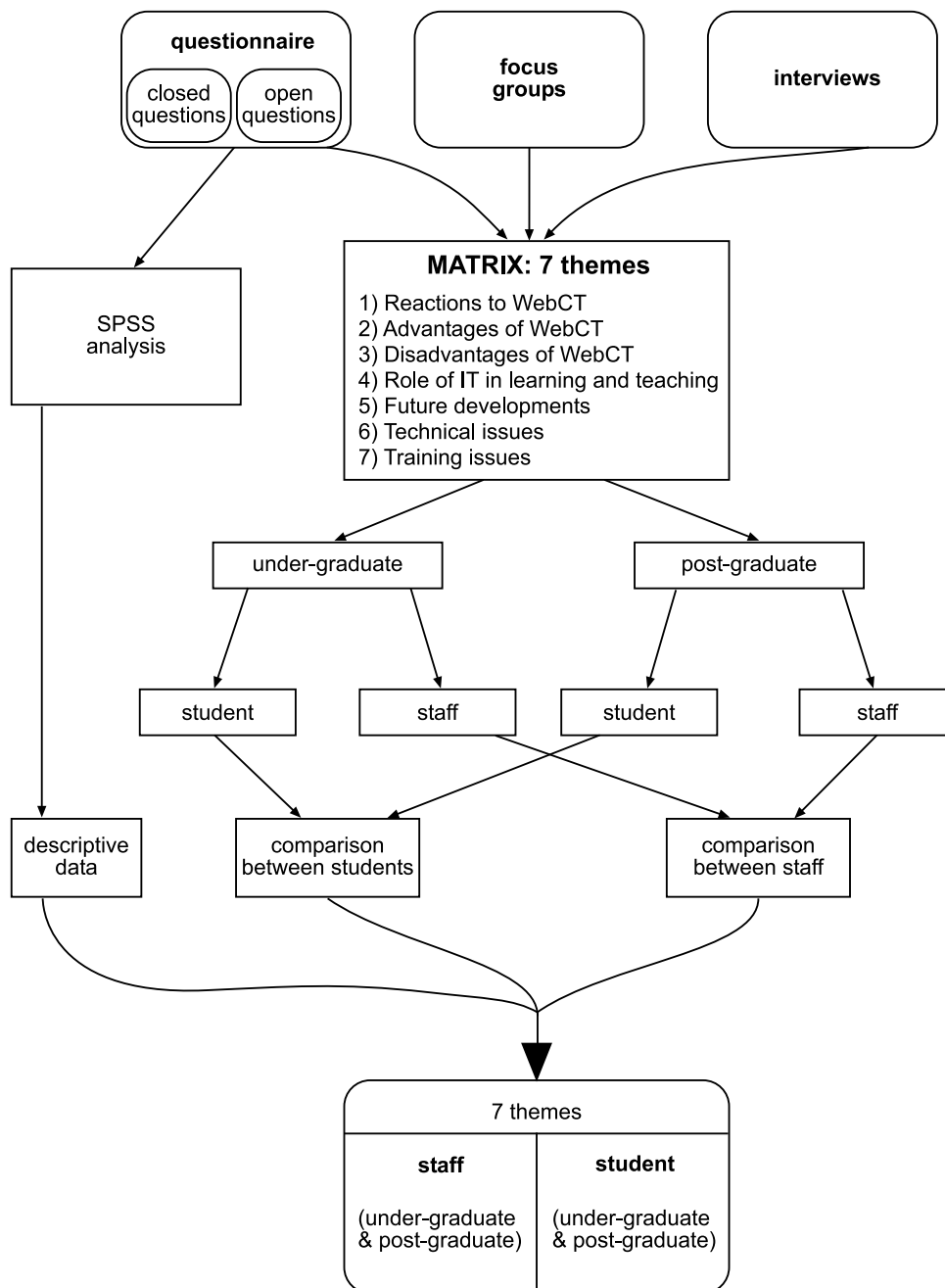


Figure 3: Flow chart summarising the data analysis procedure

As shown in Figure 3, data was gathered in three ways:

1. Student focus groups

A range of topics were identified by the researchers to be addressed in the student focus groups. One researcher, who had experience in collecting data for learning technology related projects, drafted the first version and this was then expanded upon by the other researchers (see Appendix 6). To aid data analysis especially between groups a semi-structured approach was followed (Bogden and Biklen 1992). Open questions were developed which would introduce a theme and then be expanded upon according to response by the participants.

An external moderator for the focus groups was commissioned to run the focus group and was briefed by the researchers about the project and also about the use of the WebCT in the two modules. The moderator was also provided with access to the WebCT modules to prepare for the focus groups (Kreuger and Casey, 2000). The researchers set up the rooms in preparation for the focus groups, ensured that there was a table to allow participants to sit opposite each other and checked recording equipment. One researcher, who was not involved with the delivery of the modules, also attended the focus groups and made additional notes focussing on the interactions between the students. Prior to the start of the focus groups the students were reminded by the moderator about the project (its aims and focus) and provided with another copy of the information sheet. After they had read the information sheet, the tape recorder was switched on and recording began. All focus groups were recorded.

It was proposed that a minimum of six students would attend both focus groups (Hancock, 2002) and that there would be two focus groups for undergraduate students and one for postgraduate students which would be held towards the end of the modules.

2. Tutor and student interviews

All of the interviews were undertaken by one researcher who was not involved with the delivery of the modules but was known to the tutors but not the students. The interviews were recorded.

Semi-structured interviews for tutors and students were chosen. Again, one researcher created a set of open-ended questions which were then developed with comments from the other researchers (See Appendix 7). These questions pre-defined the topics under consideration but at the same time the format of the interviews provided opportunities for participants to discuss topics in more detail, if appropriate, but allowed for some consistency between the interviews to aid data analysis (Hancock, 2002). Due to the geographical dispersion of tutors several of these interviews were telephone rather than face-to-face interviews. Telephone interviews may reduce the amount of data that is gathered (Drever, 1995). To encourage participation in these interviews and help the tutors prepare, the pre-defined questions were sent in advance to them via email. Prior to the start of the interviews the students and tutors were reminded by the moderator about the project (its aims and focus) and provided with another copy of the information sheet and then asked to sign the consent form.

3. Student questionnaires

Two questionnaires (initial and end of module) were developed by the team for each student grouping (see appendices 8, 9 and 10). The students were asked to complete these at the beginning and towards the end of each module.

The initial questionnaire was divided into two sections (see Table 4): the first section requested personal information about the student, for example, age, sex as well as

information about Internet usage. This section also included 13 questions about tools in the online environment and attitudes to technology in learning and teaching. Students were asked to rate their responses on a scale of 1-5:

1	Strongly disagree
2	Disagree
3	Neither agree nor disagree
4	Agree
5	Strongly agree

The second section focussed on general attitudes to the Internet.

The second questionnaire initially asked questions about their experience of the VLE and then returned to the 13 questions about their attitudes to online learning asking the students to again rate their responses on the above scale.

Questionnaire One	
Section One: Student data: age, sex, home country, frequency and location of access to the Internet. Attitudes to online tools, for example, email, chat and discussion room (variables 1 – 13)	Analysed in SPSS
Section Two: Student attitudes to the Internet and technology in learning and teaching	Collated in WORD
Questionnaire Two	
Section One Student response to WebCT including technical issues encountered when using WebCT, response to specific areas in WebCT and advantages and disadvantages of WebCT	Collated in WORD
Section Two Attitudes to online tools, for example, email, chat and discussion room usage (variables 1 – 13)	Analysed in SPSS

Table 4: Content of the two student questionnaires

As stated in our interim report (Appendix 2) it was decided to enhance the questionnaires from the student perspective by presenting students with the results of their first questionnaire. This gave the student the opportunity to reflect on their previous responses before completing the second questionnaire. The researcher added the matriculation number to the top of each second questionnaire and added the initial responses from Questionnaire 1. Questionnaire 2 was then circulated and students selected their questionnaire for completion. We felt that the benefit of this was to allow students to reflect on their changes of attitude to a VLE and e-learning after having engaged with the VLE for a period of study.

Data collection

The individual and focus group interviews were transcribed verbatim from the tape recorded interviews by a professional typist at QMUC (who was used to transcribing and familiar with the language of e-learning (Hancock 2002)) and was unknown to the participants and played no other part in the study. The transcripts were all in a similar format and read by the researchers in A4 format. Copies of the transcripts from the tutors' interview were sent to each tutor to ensure accuracy. This process is known as member checking and is a means of enhancing the validity of the data (Krefting, 1991). The transcripts were returned and occasionally were adjusted according to feedback.

The first and second questionnaires were matched with consent forms prior to them being entered in SPSS version 12 by a professional typist. After having been entered, one researcher applied a 10% quality control check to ensure that the results had been corrected entered into SPSS.

Data analysis

Interview and focus group analysis

Using the grounded theory approach of Strauss and Corbin (1996) to the analysis of qualitative data, the two researchers aimed to broadly follow the stages of analysis suggested by Lacey and Luff (2001) (see Table 5). This enabled comparison of concepts across the groups. Initially the transcripts were read independently and all the descriptions in the interviews were broken down into discrete parts, closely analysed and coded, being compared for similarities and differences (open coding). Important aspects relating to the students' and facilitators' experiences of using WebCT were grouped together under themes (categories); in this way, information that was found to be related in nature around a certain theme was grouped in the same category enabling the themes to emerge. When the two researchers had completed initial coding they met to compare and discuss their results. Open coding resulted in seven main categories or themes:

- reactions to WebCT
- advantages of WebCT
- disadvantages of WebCT
- role of IT in learning and teaching
- technical issues
- training issues.

During a further step in refining the coding process (axial coding) additional discussion took place regarding the naming and appropriateness of sub-categories which became evident within the different categories. The researchers discussed under which themes, certain sub-categories and any new sub-categories which had emerged should be placed. Transcripts were re-analysed and discrete parts (specific comments) were individually numbered for reference purposes (to allow cross-checking) and allocated to one of the seven themes. This process is known as peer review and minimises researcher bias thereby enhancing reliability of the analysis (Mays and Pope 1999). Data was put together in a systematic manner (See matrix listing the main categories and subcategories identified from the transcripts – Appendix 11) which enabled connections to be made between categories and sub-categories thereby linking subcategories around the axis of a category and also enabled categories and subcategories to be compared between (and within) student and tutor groups. Throughout the coding period, a record was kept by one researcher of the processes undertaken and the rationale for the development of the final categories.

- Open coding (initial familiarisation with the data)
- Delineation of emergent concepts
- Conceptual coding (using emergent concepts)
- Clustering of concepts to form analytical categories
- Searching for categories
- Core categories lead to identification of core theory

Table 5: Coding processes (Lacey and Luff 2001)

Much qualitative research now includes some biographical details of the researchers who have undertaken the data analysis. The two researchers who performed the coding were academic members of staff at QMUC; one worked as a physiotherapy lecturer in the School of Health Sciences and the other was a lecturer in the Centre for Academic Practice. Both are female, white and in their forties and have a history of undertaking educational research focussing on learning technology. The researchers knew the undergraduate member of staff and the postgraduate tutors but did not know that students before the study commenced.

Questionnaire

Due to the small number of participants in the project and consequently those that completed the questionnaires, it was decided to focus on a descriptive analysis of this data using SPSS v.12.

RESULTS

This section presents the results from the:

- Analysis of the qualitative data drawn from the student and tutor focus groups and interviews with some supplemental descriptive data from the second questionnaire
- Ordinal analysis of the collated responses to the two student questionnaires.

Results from the analysis of the qualitative data

The qualitative data was derived from focus groups and interviews. Three undergraduate and two postgraduate student interviews were completed. All four tutors involved in the master's physiotherapy were also interviewed as well as the tutor involved in the undergraduate module.

Postgraduate and undergraduate students self-selected to attend the focus groups and difficulties were encountered in obtaining sufficient numbers to attend the undergraduate focus group. Despite tutors reminding students of the dates for the events and encouraging students to attend, the first undergraduate focus group was cancelled due to non-participation but the second one was attended by three students. As McDowell and Marples state it is often difficult to find willing students to participate in evaluating technology-based learning in higher education:

“Researchers were finding themselves frustrated, anxious and even despairing of tracking down relevant students and gaining their co-operation in completing questionnaires or participating in interviews and discussions.” McDowell and Marples 2001).

It had been the intention that this focus group would run towards the end of the module but was actually conducted several months afterwards as were the interviews. The postgraduate focus group was attended by eight students and was held towards the end of the module. Table 6 shows the organisation of the interviews and the focus groups.

	Undergraduate		Postgraduate	
	Tutors	Students	Tutors	Students
Individual interviews	22 nd March (face-to-face)	7 th May x 3	3 rd March (telephone) 25 th March (telephone) 21 st April (face-to-face) 28 th April (face-to-face)	21 st April x 2
Focus groups		26 th March 3 participants		21 st April 8 participants
Questionnaire 1		September 32 completed questionnaires		September 10 completed questionnaires
Questionnaire 2		December 21 completed questionnaires		April 9 completed questionnaires

Table 6: Organisation of student and tutor interviews, student focus groups and student questionnaires

As described in the methodology section, the interviews and focus groups were analysed from the student and staff perspective and two summaries were produced which focus on the seven categories developed in the coding of the analysis:

- reactions to WebCT
- advantages of WebCT
- disadvantages of WebCT
- role of IT in learning and teaching
- technical issues
- training issues.

These summaries include actual quotations taken directly from the transcripts of the focus groups and interviews. These quotations are shown in italics and for ease of reference are shown as in the text below:

PG student interview 1 50	Postgraduate student interview 1 quotation 50
UG student interview 60	Undergraduate student interview quotation 60
UG FG 2	Undergraduate focus group quotation 2
PG FG 4	Postgraduate focus group quotation 4
Questionnaire 2	Descriptive data submitted to questionnaire 2

Written summary of staff comments

The following is a summary of staff comments after analysing the qualitative data. It is based on the seven themes of the matrix.

1. Reaction to WebCT

Although none of the postgraduate tutors had had any experience of using a VLE (in our case WebCT) and they were pleased and excited at the prospect of learning new skills and using new technology to support the module. Postgraduate Tutor 3 described WebCT as *“a fantastic tool”* (130) stating *“the students were extremely lucky to have such a tool”* (131) and that *“she was keen to continue using WebCT”* (162). This was reinforced by postgraduate tutor 1 who felt that *“it added another dimension (to the module)”* (8). The undergraduate tutor commented that the use of WebCT during the module *“was a very good experience”* although its deployment had been very limited (UG tutor 80-81). Two of the three postgraduate tutors had some initial anxieties about their lack of computer skills; however, they both remarked that these anxieties decreased as their familiarity with WebCT increased.

2. Advantages of WebCT

The tutors described many advantages of using WebCT, for instance, the postgraduate tutors focussed mainly on the online discussions and their role in improving communication between students and staff and as a support vehicle. For example, the postgraduate tutors were able to introduce themselves (by posting CVs) early in the module and felt that they knew the students online before they met them face-to-face in QMUC. The student café was a popular online meeting place where students got to know one another. The postgraduate tutors felt this peer support was invaluable especially for part-time students who continued their self-directed learning at a distance and otherwise may have felt isolated as Postgraduate Tutor 3 remarked:

“I think it’s very difficult as a part-time masters students when you’ve got a work life and a personal life outside, as you’re not just focusing on being a students as it were. I think the ability to contact people in the rest of the group and have ongoing discussions and conversations with them about, you know, work you’re preparing, I think that this is really useful”(157).

The private tutors’ area also improved communication between tutors who worked in different geographical locations and did not meet face-to-face during the module. It enabled them to raise common concerns, discuss any difficulties and to be kept informed of news relating to the running of the module by the module co-ordinator who was based at QMUC.

The tutors also felt that the online discussions had improved student engagement with the content materials. For example, the discussions resulted in the students focussing on the directed reading and addressing questions posed by the tutors as students had to post their own views/arguments on the subject under discussion. On the whole, the postgraduate tutors felt that the discussions were stimulating and thought provoking: *“we’ve had some really good discussions over the last study block”* (PG Tutor 3 136) *“I think it (i.e. the online discussion) engaged the students in their pre-reading; it gave them some sort of impetus to read it and then to have to relate it to their practice, which is what I wanted them to do. They had quite a lot of pre-reading and I think they did find some a bit hard, one particular area on multi-agency working they all got very engaged with. I think they were engaged with the things that they were familiar with and found other things harder, and I think it made me realise which bits they were finding interesting and which bits they were struggling with.”* (PGTutor 1 21).

Staff stated that WebCT allowed tutors to achieve more than would be possible through regular forms of teaching but that it needed to be used very selectively (UG tutor 19). For example, the online discussion tool was thought to be most suitable for when students do not meet regularly.

Furthermore the discussions enabled postgraduate students to start to explore subject areas and consider the issues before meeting face-to-face with the tutors at QMUC. This allowed the tutors to identify the level of the students' knowledge at an early stage and help them with any difficulties they were experiencing which meant, according to Postgraduate Tutor 2, *"the students were already half-way there"*(71). Students were encouraged to think back and reflect on the online discussions when in the face-to-face tutorial sessions which further enhanced learning. The discussions generated enthusiasm from the tutors who logged on frequently to communicate with the students. Tutors were able to respond to comments and provide feedback; direct and focus the discussions in new and more challenging directions and encourage students to relate and share their own relevant clinical experience.

"I liked to feed back to say to them (the students) well this was very good, think a little more about this (UG tutor 42 &47).

This two way contact was not only beneficial to the students but also had a motivating effect on the tutors which is illustrated by the following quotes *"I set myself specific times to go in (to WebCT) but I actually found that I was really interested to see where the next discussion point was going, so it did sort of entice me to go in more that I thought I would"* (PG Tutor 4 147).

"There was something that was in the discussion area the other day and I thought, yes, I've got something to add about that, I couldn't stop myself!" (PG tutor 2 100).

Summaries added to the online discussions (for both undergraduate and postgraduate) facilitated students contributing their own work and also working as a group in order to share and disseminate information. This resulted in a rich resource for the whole class (UG tutor 42 &47):

"One really nice thing that they (the students) did was we had three groups looking at the literature on different areas and in previous years they presented their work and that was it, whereas this year, the 3 groups collated their information and put it into WebCT so that everyone had all the information. That wouldn't have happened without WebCT so that was a really good way of using it" (PG tutor 1 23).

One of the main advantages focussed on providing easy student access to content, for example, through different types and sources of resources compared with a book or lecture. This may be providing access to a wider range of resources which are not subject-specific as well as encouraging students to explore further web-based materials (UG tutor 68-70). Providing resources electronically online (using HERON) was very popular with students as it saved time and effort and it was convenient: *"To have reading material for the study blocks 'at your fingertips' is a tremendous asset"* (PG Tutor 3 134).

Postgraduate Tutor 2 stated *"I think they liked the convenience of having a lot of the resources online, it saves them a lot of time and effort and makes their lives an awful lot easier (77).*

Several tools in the VLE: WebCT greatly assisted with the administration of the modules, for example, in the postgraduate module the calendar tool was useful for reminding students about important dates. The timetable posted in the WebCT also helped students to plan their study programme and new topics introduced in the discussion area enabled students to undertake self-directed learning with support from the tutors while studying at a distance in the workplace. The assignment drop-box was also greatly appreciated as it was easy for students to submit assignments and easy for staff after marking was completed, to enter the marks and feedback in WebCT so that students could receive this online.

3. Disadvantages of WebCT

A major disadvantage of WebCT for mostly postgraduate tutors was that there was a lack of participation by some students; the students did log onto WebCT but acted *“like sponges”* (PG Tutor 1 30) and *“lurked”* (PG Tutor 2 78). There were concerns that this would result in a more polarised class with those accessing WebCT becoming more confident than those who did not (UG tutor 10). Tutors felt that some students may have found it difficult to have an online discussion and relate to a tutor whom they had never met as they were not able to put a face to this ‘anonymous’ tutor, *“it did feel a bit strange to be posting something to people I’d never met”* (PG Tutor 2 63). Early introductions (including a photo) online may have helped to alleviate this problem.

Tutors remarked that postings were sometimes too lengthy, lacked focus and were time consuming to read. Postgraduate Tutor 1 felt that she could perhaps take action in future to improve this:

“I think I’d be more precise about how I want them to answer the questions, like the amount I want them to write and perhaps also be a bit more specific. I think perhaps it was my fault that they wrote so much because I said something like – how do you think this relates to your practice and off they went! So, I think I would be more careful next time and make sure I was getting them to think more specifically about the questions” (32). The undergraduate tutor felt the students did not like online discussions and would get more out of face-to-face sessions (UG tutor 85) and did not consider using the discussions in a broader way.

Time constraints were another concern of staff. Time was a major barrier to use: *“at first learning technologies was seen as time-saving but it was found that WebCT needs time like a garden to be set up and then maintained, for example, students had to be chased for their summaries. It was also important not to overload students, as well as staff, by using WebCT”* (UG staff 67). It was accepted by the tutor that WebCT had a considerable time commitment associated with its use and students must be made aware of this in advance.

4. Role of IT in Learning and Teaching

The staff wondered if there was a link between those who accessed WebCT and passed and those who did not access WebCT and failed (UG staff 79).

5. Future Developments

Tutors commented that it was essential to include both introductions and a task for staff and students to complete early on in the module, with step by step instructions. This would ensure that everyone was quickly comfortable with using WebCT since students interacted more once they had become familiar with each other and with WebCT. The postgraduate tutors felt that the quiz used in the initial session was well received by the students and was included for this reason. According to Postgraduate Tutor 2 *“people need to get their hands dirty”* (93) as soon as possible to establish an online community and iron out any difficulties which may arise.

The tutors felt there should be designated time on a regular basis for students and staff to WebCT:

“tutors need to go in quite frequently to actually steer the discussion in perhaps a new or more challenging direction” (PG Tutor 297).

It was important to ensure that staff either receive protected time or payment in recognition of this time commitment. It was also felt that tutors’ expectations of students should be clearly articulated at the start of the module otherwise it was easy for busy students to make excuses for non-participation. The postgraduate tutors also felt strongly that it was important to include an assessed component in WebCT to ensure greater participation by the students.

Other tutors' comments included being familiar with the students' tracking tool so that they could monitor and prompt any students who might be "lurking". Good sign posting within WebCT was also seen to be essential as were clear instructions. Tutors should also aim in the future to make postings in the discussion area more focused by posing more specific questions and by setting limits for the length of the messages to be posted by the students. Other suggested improvements included adding more content (for instance, examples of last year's summaries with consent, exam papers) and more timely content (weekly summaries) as well as extra links including other modules in the programme.

6. Technical

Some tutors had a few initial teething problems gaining access as a Teaching Assistant as opposed to gaining access as a Designer in WebCT; however they found posting messages and navigating around the module easy. One tutor had problems accessing WebCT due to a firewall at work but there were no problems for tutors accessing from home (without broadband). The tutors stressed that it is important for them to have a support contact in case of any difficulties with WebCT. Some undergraduate students who had experienced access issues with WebCT from outside the institution had contacted the supporting department for advice. One student living in Athens had some problems with access and others complained that they had intermittent problems with computers crashing.

7. Training

An initial training session for tutors and students was considered essential and extremely useful since it covered 'the why and the how'- the rationale for using WebCT as well as how to use WebCT, where to find materials, the benefits in comparison to other resources:

"It was excellent to have an initiation session with the students to cover common ground..." (UG tutor 27-30)

"I wouldn't say I particularly enjoyed the initial training because I just felt 'Oh Goodness how am I going to manage?' but once I got going with it, it was fine and I think then with hindsight that some of the points we got from the training session were actually quite useful and certainly we got some handouts which were nice to be able to take away and read through." (PG Tutor 2 64 and 88).

Tutors felt that they would benefit from regular training updates to familiarise themselves with the tools available in WebCT when appropriate.

Written summary of student comments

This section provides a summary of the student comments based on the seven themes in the matrix.

1. Reaction to WebCT

Initially both groups of students expressed ambivalence towards using WebCT in their learning. The postgraduate response was quite positive: they were interested in WebCT and eager to try it but there was also some nervousness. The undergraduate response was much more varied: some liked the idea of using computers in their learning whilst others were unsure if they would use WebCT. There was also concern about learning yet another computer system with all the others that the students had been introduced to at the beginning of the semester: *"..we'd been learning how to use the network system ... and this were different from high school networkingand all these are separate things and trying to remember how to access them all and things.."* (UG student interview 1). Nevertheless both student groups liked the design of WebCT and found it user-friendly.

By the end of the modules, the ambivalence remained. Some undergraduates felt that WebCT offered no significant benefits whilst others found it useful as an information repository which could be accessed, easily and quickly. Postgraduate also liked the ease of access to materials: *"It made the access to reading material as easy as sitting in a library which was very, very good"* (PG student interview 1 105). Postgraduates specifically recommended WebCT and particularly liked the communication tools. However, they stated that they did not want to lose the face-to-face components of the module since they felt it would be isolating to study the module only using a VLE, *"WebCT was a good adjunct to F2F sessions with staff but certainly shouldn't take over from personal interaction"* (PG FG 170).

2. Advantages of WebCT

The main learning and teaching benefit expressed by undergraduate students was quick and easy, reliable access to web-based materials at any time: *"I always felt it was there"* (UG student interview 23). This access provided them with a security net: a 'one-stop shop' where they could find the materials without bothering anyone else; this was an important difference to being at school *"..I found that everything was there that you needed... you didn't need to go and ask..."* (UG student interview 13). Hence, they liked the summaries (almost all the responses in the questionnaires found them useful or very useful) because they clarified ideas in more depth and covered areas that were not necessarily in the book. In addition, most liked working with a partner to develop the summaries because it allowed them to measure and check their ideas against someone else's – *"..it's a good way to see what your peers are thinking..."* (UG student interview 30 & 49). The students could skim read the summaries, at first, and then use them for revision purposes especially against past papers. They also used the links to additional materials especially those with interactive quizzes which provided a contrast to reading text which could be "boring" (UG FG 103). The postgraduates were also very keen on access to materials; they all used WebCT to access reading material (especially via the HERON links) and they valued being able to print copies of papers from journals.

The main difference between the student groups was in their attitudes to the online discussions: only a few undergraduates made positive comments focussing on reading administrative-type notices whilst the postgraduates highly valued the online discussions. WebCT enabled the postgraduates to communicate at a personal level (through the student café), to share concerns and provide mutual support especially whilst balancing work and studying: *"Seeing that other people felt the same as you at certain stages helped a lot"* (PG student interview 1 117). Students reported the desire to log on frequently to read and follow the discussions and most responded either immediately or

after reflecting on the topic under discussion. A few other students just followed the line of the discussion but did not participate: *“Reading the discussions I’d find that I’d have to go and read up on a topic because the others had discussed it”* (48) *“sometimes I wasn’t sure of the topic being discussed e.g. legislation in Scotland so I’d go away and read up on the topic, by the time I got my own ideas the discussion had changed so I didn’t tend to post I’d just go in and read messages”* (49) (PG student interview 2).

The postgraduate students particularly liked the input of the tutor to the online discussions: *“the role of the tutor is critical because the quality of the discussions are changed perceptibly by the questions posed by the facilitator”* (PG student interview 1 117). Regular involvement and feedback from the tutor was a motivating factor and helped students ‘to stay on the right track’ *“it was good to get feedback as you went along”* (PG FG 193). Also the participation of other students studying the module influenced others to go online and participate:

“finding out how far behind I was motivated me to catch up” (PG FG186).

“I would check the discussions fairly regularly but what I tended to do was go on and have a look at it, think right somebody’s written that and go away and think about it and come back at a later point and type something into the discussion” (PG FG 173).

The postgraduate students valued other features within WebCT, for example, the calendar tool for planning their studies. The assignment drop box (and the test area within it) was also very popular because students would have more time to write the assignments rather than worrying about allowing sufficient time for posting: *“it saves time, you can go up to the last minute, do corrections and then send it”* (PG student interview 2 53); *“It was so nice just posting the assignment in WebCT and not having to worry about getting it in person. We had a postal strike in Oxford for 3 weeks so that would have been a big panic posting things and getting it there in time”* (PG FG 176).

3. Disadvantages of WebCT

The main disadvantage for undergraduate students focussed on the content which was available in WebCT. Their criticisms varied, for example, some students felt the material to be irrelevant, others that it was not sufficiently interactive and a few disliked it because it was on computers as opposed to paper-based. Some students did not access the summaries because the information could be sourced elsewhere – in books, lectures notes (UG FG 99) and did not appear on a regular basis. There was some concern about using peer-sourced information: *“..I think for the summaries you would have to be careful, like some people might think things are important and you might think that’s not important ... so I prefer to just do my notes by myself.”* (UG FG 100). Students compared the materials on WebCT with that available on alternative websites and CD-ROMs, such as the ADAMS program (an interactive anatomy program), which were more popular because they were more visual, three-dimensional, animated and had quizzes, worked examples, tutorials and flash cards. These were perceived to be more memorable (UG student interview 58-60) and more fun: *“..everything moved and it was good, it wasn’t just like reading a bit of paper...”* (UG student interview 16-18).

For postgraduates most responses focussed on the discussion area, a comparison of this area with a face-to-face learning experience and interactivity. For example, students noted the anonymity, lack of non-verbal communication and instant feedback as a barrier to them becoming involved in the online area. This barrier often resulted in a lack of participation, for example, students were uneasy about posting a message on an area in which they had limited clinical experience. Consequently those students who did post were annoyed by ‘lurking’ students who read the postings but did not actively contribute to the online discussions. Students who contributed felt aggrieved that due to a lack of an assessed component in WebCT those who did participate were not given any credit for taking part in online discussions. They were also concerned that the lack of interactivity

could present problems for tutors; in class situations students felt that some tutors were able to 'read' the class very well as a result of verbal and non-verbal cue and able to explore areas which were confusing. Undergraduates also felt that it was easier and more informal to talk face-to-face rather than online.

In addition, postgraduate students reported that they found WebCT (and especially the online discussions) time consuming:

"if the time commitment for WebCT could be pre-identified as a requirement for what you do in the Masters programme, in the same way as the weeks of study block attendance, it would mean that you could negotiate that as study leave with your boss" (PG student interview 1 124)

"I think you need a lot of time to sit down and do it; by the time I sort of got my laptop out, set it up, plugged it all in, got onto the internet and then got onto WebCT and you know if you're writing messages and things the time just sort of goes and it puts me off going in because I know that I am going to see messages I want to respond to and I haven't always got time to sit and think about it" (PG FG 198).

4. Role of IT in learning and teaching

Postgraduates felt *"using the computer to access lots of information has affected my learning enormously. Using the electronic library is like saying 'Abracadabra'- it's fantastic especially as I live in the sticks and we haven't got a library" (PG student interview 1 120)*

"the accessibility of it (IT) and the fact that you can do a search and look up topics and the ease of it as opposed to having to go to a library, just make you do it" (PG FG 208).

Students also appreciated that they were able to explore topics more widely:

"You come up with much wider issues when reading different journals than you would tend to by just keeping up with your own professional journal. I think information technology makes you look at a wider scope" (PG FG 210).

This contrasted with the undergraduate students who had more concerns about accessing materials online; some students said they liked and felt safer having paper copies which were easier to read and where text could be highlighted: *"I still like to have books and paper."* (UG FG 112-113). Web-based materials, undergraduates felt, were good for quizzes, reviews, (UG FG 141) back-ups and for providing a different learning experience: *"you can get a wee bit bored of just writing away.."* (UG FG116). They also had concerns about students with weak IT skills using WebCT.

For the postgraduates, WebCT enabled them to study topics at home living at a distance from QMUC:

"I think having done modules at other universities, I've really enjoyed having WebCT as a tool. The other modules I've done have been, you know, one day a week but with WebCT you've got this continuous sort of connection with the other people on the module" (PG FG 203).

They also felt that tele-conferencing might be an alternative form of communication with the added benefit of non-verbal communication. Even though the undergraduate students were more mixed in their attitudes towards IT in learning and teaching, they believed that IT was an essential because prospective students would not study at an institution if IT was not widely available (UG FG 127).

5. Future developments

These focussed on increased access to content and the tools within WebCT (especially the discussions). Most suggestions from the undergraduates focussed on increased access to content (including overviews of books), more personalised content and more relevant links to additional resources which would reduce the time *“looking through loads of stuff that’s not relevant”* (UG interview 42). This would help students to be more independent (UG interview 14), clarify ideas presented in the lecture and help with the shortage of books. Access and quicker access to PCs was also essential (UG interview 61-63). Postgraduate s too wanted more access to content, for example, students would like some lectures to be delivered as narrated PowerPoint presentations in WebCT which they could watch as often as necessary for clarification. They also wanted improve sign-posting within WebCT of module content relating to the release of materials.

Most of the postgraduate suggestions focussed on the use of the discussion tool. Some less IT-experienced students had taken time to feel comfortable with posting messages; therefore, an early introduction to the online area was considered essential to encourage students to participate. This could be through a specific task such as posting introductory CVs and photos. In addition, students felt that there should be an assessed component for the online discussions which would ensure greater participation by all individuals; this would be instead of one of the current assessments rather than an additional one. Ensuring sufficient time for the online discussions was also critical; students felt they should have been informed earlier of their time-commitment to these discussions and that online involvement should be pre-identified as a requirement of studying. More guidance from tutors as to their expectations for postings, for example, word length, would have improved this. This is essential when students are negotiating study leave with managers and also will highlight the fact that students require Internet access. Undergraduates were less interested in the online discussions but could see it had a possible role when students do not physically meet so frequently, for example, on placements. It is essential, however, for the tutor to continuously remind students about WebCT (UG FG 130).

It was notable that few undergraduate students had ideas in this section. Students stated that this was because they were not ‘a computer person’ and therefore they did not have any suggestions about the future role of WebCT. Others were satisfied with the product and could not think of any improvements. A few stated that WebCT was not appropriate for their particular subject area and thus they had no suggestions for future implementation. (UG FG 107).

6. Technical

All postgraduate students wanted to log on to WebCT at the introductory session; this had not been possible due to late matriculation which caused delay in creating WebCT user accounts. After this had been resolved, they experienced no technical or access issues. In comparison, for the undergraduate, access was a key concern. Some students were extremely frustrated at not being able to access a reliable, quick PC at QMUC especially at assignment time: *“the supply is woeful”* (UG student interview 52) and/or a PC that was not in the Library where other resources were available (UG student interview 53). Access from outwith QMUC was also identified as a key issue as well:

“I had a lot of trouble logging on from home, which is where I do most of my studying” (Questionnaire 2, UG). Some of the students did not know about WebCT support but believed that the lecturer had contacted someone about the access issue.

7. Training

Both postgraduate and undergraduate students appreciated the initial introduction to WebCT especially which they could follow whilst logged onto WebCT (UG FG 68-69):

“ I think having the group training session (with the module co-ordinator introducing the WebCT module) where you were actually taught how to use it , was useful,. It's sometimes easier just talking to somebody, another student.... (PG FG 167)

“I had done modules before on-line so I had just learned how to use WebCT from the information. I found it quite useful the first time but being shown personally this time was definitely easier than figuring it out for yourself “ (PG FG 215).

The undergraduates were ambivalent toward the documentation provided about WebCT – some found it useful, others did not remember it and preferred to watch and learn. The undergraduates also noted that they wasted a lot of time searching for materials (UG student interview 43) or that they only used the database that they were familiar with (UG student interview 65); a recap of online resources at the beginning of the second-year was therefore suggested.

Results from the analysis of the questionnaires

a) First questionnaire

The first group of 32 students was self-selected to complete questionnaire 1 was from the BSc (Hons) in Physiotherapy. Predominantly female, ages ranged from 18 to 50 with most students originating from the United Kingdom especially Scotland.

The first questionnaire was also completed by the second group of eight students who self-selected from the MSc in Physiotherapy. Ages ranged from 22 to 50 with a mixture of home and international students. In both groups, approximately the same number had received some formal IT training before commencing their programme of studies and were familiar with email and the Internet (see Table 7 for details)

Sex	Undergraduate	Postgraduate
Female	24	6
Male	6	2
Ages		
18-21	26	
22-25		3
26-30	1	1
31-35	1	1
36-40		1
41-45		1
46-50	1	1
Country of Origin		
Scotland	22	3
Rest of UK	7	2
North America	1	
Asia	1	
India	1	2
Other		1
Training		
Some training in IT	19	5
No training in IT	11	3

Table 7: Student details obtained from student completion of the first questionnaire

b) Second questionnaire

21 students completed the second questionnaire from the first year module and 8 students from the master's module.

Analysis of responses to student questionnaires

Due to the small number of respondents to the questionnaires a basic ordinal analysis of the data was undertaken focussing on the 13 questions that had been drawn from the two questionnaires (see Table 8). These variables are differentiated by two asterisks (**) clearly marked by the side of the variable in Questionnaire 1 and 2 (see Appendices 8, 9 and 10). These asterisks were not on the original questionnaires provided to students. Variable 3 is a negative variable whilst all the other variables are positive.

List of 13 variables used in student Questionnaire 1 and 2	
1.	Student confidence in using the Internet
2.	Student confidence in communicating with lecturer via email
3.	Lack of student confidence in using online discussions which read by peers
4.	Future student use on a regular basis if published on the web: Diagrams
5.	Future student use on a regular basis if published on the web: glossary
6.	Future student use on a regular basis if published on the web: extra resources
7.	Future student use on a regular basis if published on the web: links to other websites
8.	Future student use on a regular basis if published on the web: self test quizzes
9.	Future student use on a regular basis if published on the web: summaries of lectures
10.	Future student use on a regular basis if published on the web: videos
11.	Future student use on a regular basis if published on the web: online discussions
12.	Student attitudes to the Internet as a valuable tool for learning
13.	Student attitudes to more technologies in learning

Table 8: Variables drawn from the two questionnaires and used in the ordinal analysis

Primarily the median value was determined for each of the 13 variables for each questionnaire (see Table 9) and then 'box and whisker' plots were created for each of the 13 variables (see Appendix 12). 26 'box and whisker' plots were created in total: 1 for each variable which shows the results for each student group (undergraduate and postgraduate).

The following legend applies to the 'box and whisker' plots:

- The median value (a solid black line)
- The interquartile range for the first questionnaire (cross-hatched)
- The interquartile range for the second questionnaire (grey)
- Outliers are displayed through an asterisk with a number. This number equates to the student entry in SPSS.
- An ordinal scale: 1 – 5 where:

1	Strongly disagree
2	Disagree
3	Neither agree nor disagree
4	Agree
5	Strongly agree

Four box and whisker plots have been included in this section. These are specifically referred to in the discussion section of the report:

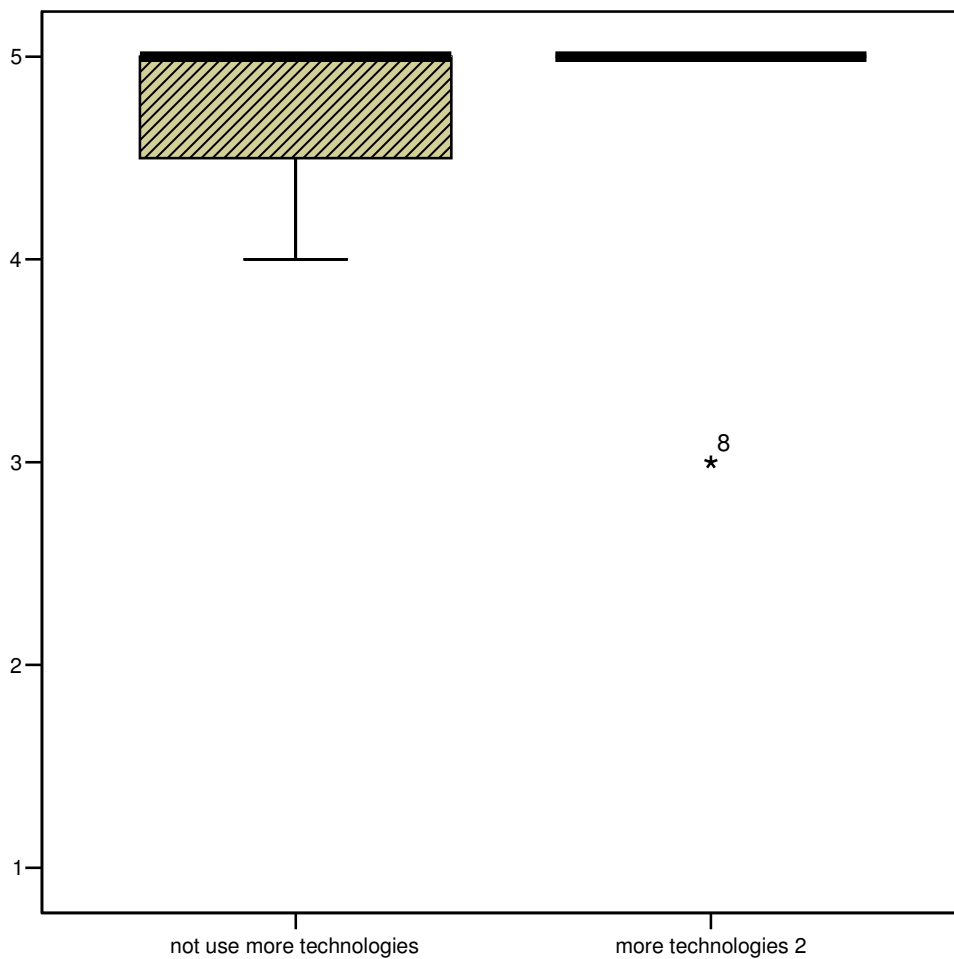
- Postgraduate questionnaires: variable 13: attitude towards more technologies in learning
- Undergraduate questionnaires: variable 13: attitude towards more technologies in learning
- Postgraduate questionnaires: variable 11: use on a regular basis if published on the web: online discussions
- Postgraduate questionnaires: variable 11: use on a regular basis if published on the web: online discussions.

Variable	Undergraduate			Postgraduate	
	Median Questionnaire 1	Median Questionnaire 2		Median Questionnaire 1	Median Questionnaire 2
1. Confidence in using the Internet	4	4		4	5
2. Confidence in communicating with lecturer via email	3	4		5	5
3. Lack of confidence in using online discussions which read by peers	4	4		2	2
4. Use on a regular basis if published on the web: Diagrams	5	5		5	5
5. Use on a regular basis if published on the web: glossary	5	5		5	5
6. Use on a regular basis if published on the web: extra resources	4	4		5	5
7. Use on a regular basis if published on the web: links to other websites	4	4		5	5
8. Use on a regular basis if published on the web: self test quizzes	5	5		5	5
9. Use on a regular basis if published on the web: summaries of lectures	5	5		5	5
10. Use on a regular basis if published on the web: videos	3	3		5	5
11. Use on a regular basis if published on the web: online discussions	3	3		5	5
12. Internet valuable tool for learning	4	4		5	5
13. More technologies in learning	4	5		5	5

Table 9: Median distribution of 13 variables from two questionnaires completed by the student groups

POSTGRADUATE QUESTIONNAIRES
 VARIABLE 13: ATTITUDE TOWARDS MORE TECHNOLOGIES IN LEARNING

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
use more technologies	7	87.5%	1	12.5%	8	100.0%
more technologies 2	7	87.5%	1	12.5%	8	100.0%



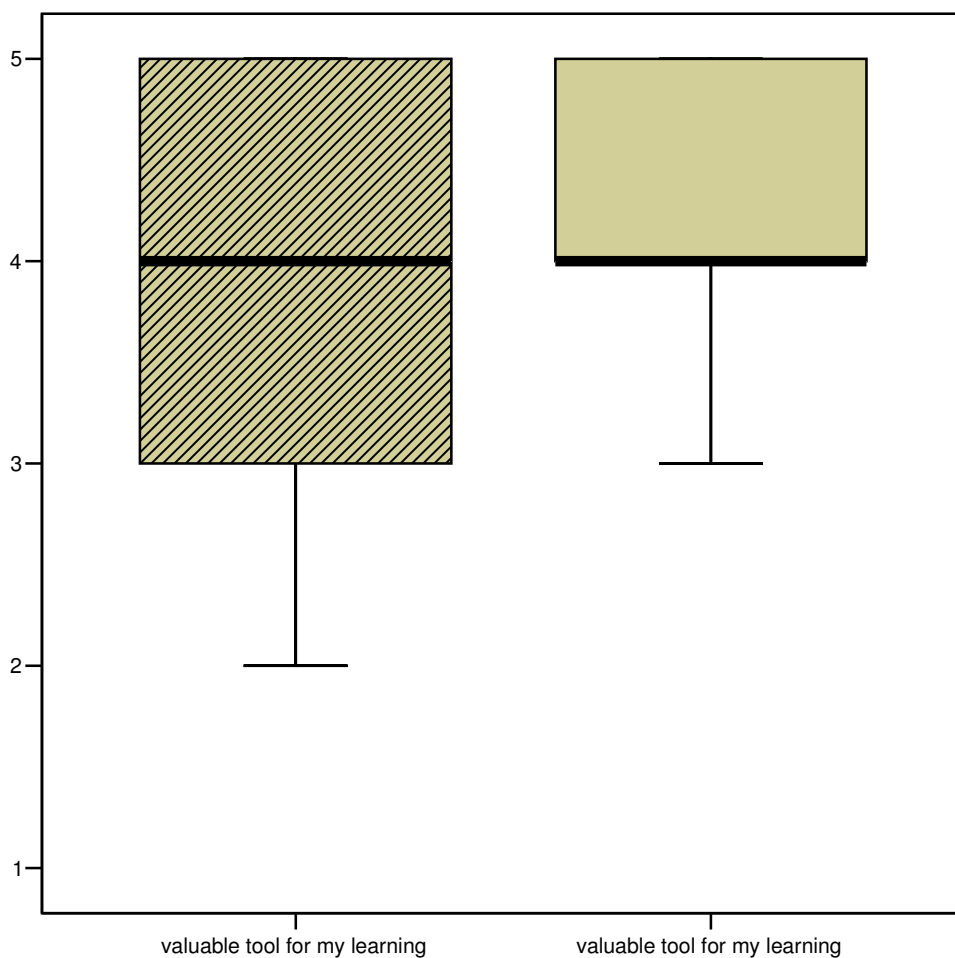
In this example for postgraduate students, the first box shows the response of students to the first questionnaire. The median is 5 and there is a small interquartile range. Most students answered 5 (strongly agree) and one answered: 4 (agree).

The second box shows the median as 5 but with no interquartile range. There is only one outlier: student 8 who answered 3.

Although small numbers this would seem to indicate that students are more positive in the attitudes towards technology in the learning environment.

UNDERGRADUATE QUESTIONNAIRES
 VARIABLE 13: ATTITUDE TOWARDS MORE TECHNOLOGIES IN LEARNING

	Valid		Cases Missing		Total	
	N	Percent	N	Percent	N	Percent
valuable tool for my learning	19	86.4%	3	13.6%	22	100.0%
valuable tool for my learning	19	86.4%	3	13.6%	22	100.0%

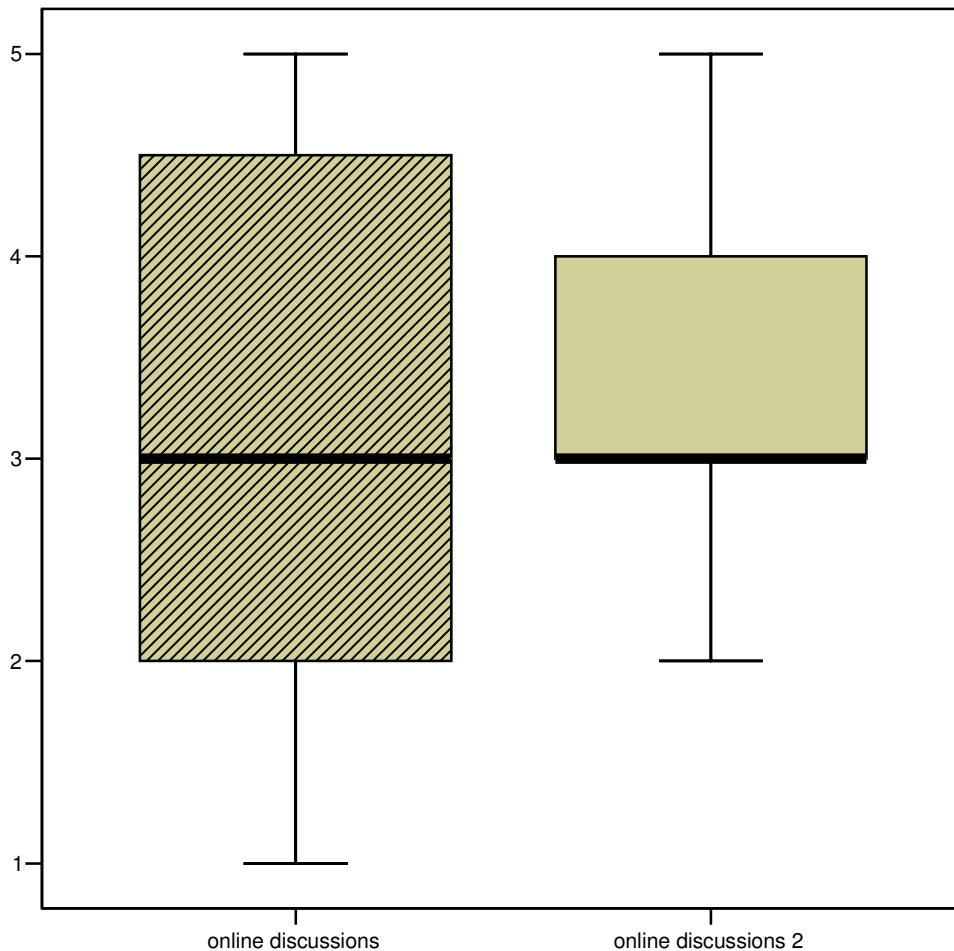


In this example, the first box shows the response of students to the first questionnaire. The median is 4 and there is a larger interquartile range. The second box shows the median as 4 but with most of the interquartile range above the median. There are no outliers.

Although small numbers this would seem to indicate that students are more positive in the attitudes towards technology in the learning environment.

UNDERGRADUATE QUESTIONNAIRES
 VARIABLE 11: USE ON A REGULAR BASIS IF PUBLISHED ON THE WEB: ONLINE DISCUSSIONS

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
online discussions	19	86.4%	3	13.6%	22	100.0%
online discussions 2	19	86.4%	3	13.6%	22	100.0%



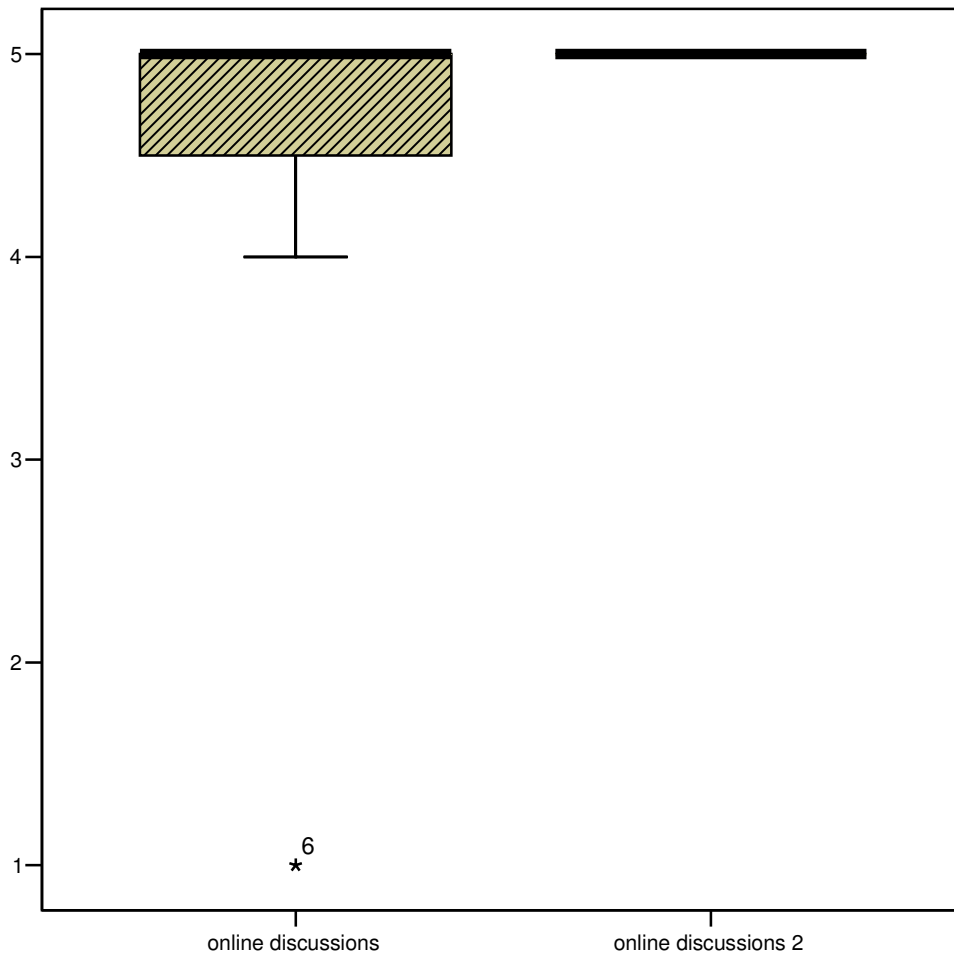
In this example, the first box shows the initial response of undergraduate students to the first questionnaire. The median is 3 and there is a wide interquartile range.

The second box shows the median as 3 but with most of the interquartile range above the median.

This is a much more mixed response than the postgraduates and reflects the diversity of views about online discussions in the undergraduates.

POSTGRADUATE QUESTIONNAIRES
 VARIABLE 11: USE ON A REGULAR BASIS IF PUBLISHED ON THE WEB: ONLINE DISCUSSIONS

	Valid		Cases Missing		Total	
	N	Percent	N	Percent	N	Percent
online discussions	7	87.5%	1	12.5%	8	100.0%
online discussions 2	7	87.5%	1	12.5%	8	100.0%



In this example, the first box shows the response of postgraduate students to the first questionnaire. The median is 5 and there is a small interquartile range. Most students answered 5 (strongly agree) and one answered: 4 (agree). There is one outlier: student 6.

The second box shows the median as 5 but with no interquartile range.

Although small numbers this would seem to indicate that students are extremely positive in attitudes towards online discussions.

Discussions

In this section we consider some of the main themes that have emerged during the study and which relate to the different student groupings discussed in the literature review. These themes include:

- Perspectives on learning and the use of e-learning in a university environment
- Advantages and disadvantages of the online learning environment
- Changing tutor and student roles.

Differing perspectives on learning and the use of e-learning in a university learning environment

Our study would seem to reinforce the differing student groupings described in the literature and 'puts into the spotlight' some commonly held beliefs by students about: what studying entails; their anticipated role and their tutor's role and how they perceive learning should occur in an educational institution. The postgraduate, part-time, mostly off-campus students were in the main, studying voluntarily to improve aspects of their clinical practice. Although keen to pass their programme of studies, they had a very different perspective on learning and knowledge acquisition to the undergraduates which was subsequently reflected in their use of the e-learning environment. The postgraduate students wanted easy access to current materials, especially from journals, to help inform their interactions in the clinical and academic setting. Knowledge was something for them to be internalised and dissected: an artefact to be the basis of an informed dialogue with their peers and tutors. Due to the nature of their lives (work commitments, personal responsibilities) it was necessary for these dialogues to be online rather than face-to-face. Hence they liked the VLE: WebCT because of the flexibility it provided as a communication channel.

In contrast, the undergraduate students were assessment-driven and focussed on completion of the programme. Thus, knowledge to them would seem to be an external artefact to be gathered, stored and absorbed rather than engaged with. This would seem to be at odds with Frand's (2000) work and his ideas that 'generation X' students are more interested in the process of learning rather than the knowledge itself. However, it would seem to concur with the work of Saunders and Klemming (2003) who point out that students traditionally seem to view higher education as 'an information-gathering exercise', and therefore they do not engage in problem-solving student work and discussions enough to gain real benefit. Consequently, the undergraduate students' main criticisms of the online environment focussed on the content held or not held within the VLE. For example, they had concerns about the usefulness of the peer-generated summaries since they were not provided by the tutor and the timeliness of the content which did not always coincide with the lectures. As generation X students, some of them preferred these knowledge artefacts to be in a multimedia format: three-dimensional and animated which they felt would alleviate the 'boredom' of text and support visual and auditory preferences for learning. Such ideas were consequently reflected in their perceptions and use of an online environment: a "one-stop shop" for gathering information, any time and any place but one that did not encroach onto their traditional perceptions of how learning at a bricks and mortar academic institution was undertaken. Hence online discussions were seen as inappropriate since they did not fit in with this passive approach to learning: they were considered to be an unnecessary diversion from the essential task of assessment-focussed activities in order to pass the programme of study and enter their chosen profession. This perception of learning led to a more restricted view of technology's role in learning and teaching. Therefore, whilst postgraduate students had lots of ideas for the future implementation of the VLE,

undergraduates had few and tended to focus on the provision of content, if they had any at all.

Therefore, it seems that the postgraduate tutors reinforced their students' perspective of learning through their positive support of the online discussions and encouragement of their students' active engagement with the online materials. For example, the tutors' postings focussed the students on the directed readings and then encouraged student debate and dialogue relating to clinical practice both online and in their occasional face-to-face meetings. In contrast the undergraduate tutor preferred to use WebCT as an online information repository reinforcing the students' model of knowledge acquisition. For undergraduate students this may have long-term implications since as lifelong learners they will need to acquire the skills of an independent learner with the ability to handle and dissect knowledge in their professional working lives.

Advantages and disadvantages of the online learning environment

The results of this study demonstrate that a VLE can serve as an easily accessible one-stop online multimedia repository for students which certainly has its merits, for example, it provides opportunities for student rehearsal, reinforcement of tutors' lectures, increases student engagement with the module, increases feelings of security, improves motivation and reduces time required for processing administrative issues. Undoubtedly the access to a wider range of resources is beneficial and may support motivated students to research more widely into a subject area or around a subject area. For postgraduate students, the resources held in a VLE were a 'time saver.' The administrative tools, such as the calendar and assignment drop box, were also reported to save valuable student and staff time. However, if left at this level, the online environment may also have a detrimental effect of reinforcing the passive, knowledge-acquisition model of learning as opposed to preparing learners to become independent lifelong learners capable of handling and dissecting a wide range of sources of information quickly. A more advanced implementation of the online learning environment which considers what the students potentially may do with the learning artefacts available to them within the online environment, can encourage independent learning and assist in supporting in-depth engagement with the materials. For example, the postgraduate tutors were able to provide feedback on student postings and steer the students into new and more challenging directions.

Tensions may arise, however, when the two models clash, for example, it was noticeable that the postgraduates who were studying full-time, on campus did not engage with the online environment to the same degree as the part-time students, especially at the beginning of the module. This led to their lack of engagement with the online discussions and derogatory mutterings about 'students being like sponges' amongst those students who were more active. For these full-time, postgraduate students, the online environment had not met their anticipated perceptions of learning at a bricks and mortar institution; however, one of these students when interviewed believed that if given the opportunity to participate in online discussion in the future involvement would be increased. This clash was also noticeable for the undergraduates who were very ambivalent towards the online environment and were sometimes antagonistic towards the VLE since they believed it could impact on their tutor-student relationship.

Changing tutor and student roles

Underpinning attitudes to using a VLE, are tutor and students perceptions of their roles and expected roles in the learning environment in higher education. For example, undergraduates will often state that they like the idea of independent learning but in practice they are more comfortable with the traditional approach of the tutor providing information (Crook 2002). This was reflected, for example, in the undergraduates' attitudes to other students' work (for instance the summaries) which was often considered inferior to that of the tutor's who is still perceived as the 'font of all knowledge'. In contrast, most of the postgraduates had moved away from this traditional perception of the tutor and preferred a 'guide on the side' role who was assisting and supporting them in their learning. This relates to Salmon's (2000) model of teaching and learning online through computer mediated conferencing (CMC) whereby students are guided by the tutor through her five stages, eventually reaching the final stage and 'sailing off into the sunset' alone.

Therefore, as Goodyear shows, tutors need to adapt their role when employing a VLE. If tutors do not consider their underpinning educational philosophy and approach to learning and teaching, they and their students will not gain the full benefits available to them in e-learning. For example, a lot of planning is required before deploying e-learning as shown in the case study of Bradley and Boyle (2004) in their description of moving online at London Metropolitan University. Another key role for the online tutor is to support students to become independent learners through the online environment. This will involve challenging their students' underlying assumptions about being a learner in a university, explaining about lifelong learning and the skills, including independent learning, which will be required throughout their life time of work.

During the course of the present study the following issues which specifically related to e-learning became apparent and will now be discussed:

- Communicating online
- Technology in the learning environment
- The importance of induction
- Time: the new distance.

Communicating online

Both postgraduate tutors and students were very positive about the online discussions for improving support and deepening engagement with their learning materials. Social interaction is an essential element of the learning experience and the online student café for the postgraduates provided an ideal opportunity for this. The students created an online community where they could communicate at a personal level, share concerns and provide mutual support on a more regular basis. For onsite undergraduates this role of an online discussion was not appropriate since their need to be in constant contact (as described by Oblinger 2003) was fulfilled via, often unstructured, face-to-face meetings with peers and tutors. However, some undergraduates did see the possible relevance of online discussions when on placement and geographically dispersed.

The postgraduate students all referred to the need for the tutor's active presence in the online discussions. The postgraduate students did not state that they wanted every one of their individual postings replied to by the tutor but they needed to know that the tutor was checking that the discussions were on the 'right track'. Tutor participation motivated students to participate in the online discussions. The type of questions posed by the tutors was also important in stimulating discussion: some of the students felt alienated from the online discussions because the questions required the students to draw on practical

experience which not all of them possessed. On reflection, the tutors realised the implications of posing such questions and for the future aim to pose more generic questions which will be relevant to all and not marginalise any students.

Our study also demonstrated that the tutor has a number of specific roles as the moderator of the online discussions. For example, specific guidelines must be provided about expected student participation levels and the level of support that is available from the tutors. In future the postgraduate tutors plan to provide clear guidance on the amount of words expected from students to each posting. Another tutor role is to help students familiarise themselves with what can be perceived as the anonymous space of the online discussions with its emphasis on text (Medlin, 2004), lack of spontaneity and visual cues. The tutor's role is to ensure that the students move into this online area and start to familiarise themselves with it as soon as possible and then quickly become active participants in the online community. Tutors also have a role in dealing with 'lurkers'; lack of participation frustrated some students and tutors. In this instance, the tutors have decided to change the assessment pattern to incorporate online discussions to ensure that all students actively contribute in the future.

Technology in the learning environment

In any discussion about e-learning and its deployment, it would be impossible not to consider the technical dimension, as clearly shown in the results section of this study. Although there have been considerable advances in the development of hardware and software, in the academic and clinical setting information technology systems are not 100% robust. From our study, it also appears that there remain issues for student and tutor access to Internet-enabled computers especially for some off-campus international students and on campus students at peak times within the semester, for example, near to assessment submission dates. It can also not be assumed, despite recent studies, that all students will own their own computer nor that they will have broadband access to the Internet. Therefore, for postgraduate offsite students especially, it is essential that they are aware prior to the start of the programme that such access is essential.

From an institutional perspective, the technical support offered to tutors and students needs to be timely and pro-active or this may lead to further problems, for example, some of the undergraduates had difficulties in accessing the VLE (WebCT) but did not contact support. These issues were harboured by the students as grumbles and gave them reasons why not to access the VLE. In the area of health education this is once again reinforced by Pelletier (2002) who found that the nurses in her study needed IT support to prevent the entire learning experience becoming a negative one. Oblinger (2003) goes as far as saying that what a new generation of adult learners expects is 'customer service', an essential prerequisite for retention and effective learning. Therefore as Williams (2001) states:

"the clear message [was] that those developing materials for use in an electronic environment need to pay attention to user needs beyond those associated with the pedagogy of the subject".

There are additional technical concerns, as voiced by the undergraduate students (despite the work of Oblinger and Frand), about lack of confidence in technical skills. Attitudes to technology and technology in the learning environment were also very mixed: some undergraduate students did not perceive that technology had a role in their learning, disliked using computers whilst others wanted it to provide a more varied interactive learning environment, for example, through animation. However, almost all the student felt that technology had a future role in learning and teaching. Information literacy skills were also a concern, for example, in the future recommendations for the VLE, undergraduate

students wanted more materials to be provided online since they felt swamped with finding materials through Internet-searches which were inappropriate. Training in this area may save time for some students as well as increase their ability to function as an independent learner.

The importance of induction

All tutors felt that a hands-on induction, preferably with an interactive exercise for students to complete which would ensure that the students familiarised themselves with using the VLE, was essential. This introductory session should not only focus on the how of using the online environment but also on the integral role of the VLE in supporting and facilitating learning and especially the students' role in building the online community. This specifically links to the work of Leung and Ivy (2003) who note that tutors should make clear from the outset the goals and objectives of online materials early on in the course. From the present study, it would seem that this session should also ensure that students plan for their regular involvement in the online community and have a clear mental picture of what is expected of them. For undergraduate, on campus students this would particularly help them to visualise the role of the VLE in assisting them to become independent learners and pass their assessments. To ensure students' continuing use of the VLE, tutors need to refer to it on a frequent basis to remind students of its continuing role in supporting their learning.

Time: the new distance

A recurring theme throughout this study and the literature has been time: the lack of this precious commodity and the consequent impact as a barrier to the full implementation and use of e-learning. Tutors refer to the lack of time for

- *Planning* how they will use an online environment. This is not just time for developing their technical skills but time in thinking about how the VLE will change how they teach and how the students will learn. Also tutors need time to become familiar with the online environment which will usually decrease any anxieties
- *Deploying* a VLE. All the tutors referred to the importance of inducting students into the VLE. However, this induction takes precious time from an already crowded timetable and with large classes may require two or three sessions to ensure all students have been introduced to the VLE
- *Maintenance* of the VLE. One tutor referred to a VLE as 'like a garden that needs looking after for the flowers to bloom'. Resources need to be added on a regular and timely basis. Online discussions require tutor time, as highlighted by the postgraduate tutors, which needs to be timetabled and protected or is in danger of becoming the weekend/evening duty.

Many institutions offer training programmes in e-learning which it is hoped will increase usage of the VLE; these are essential, providing guidance, familiarising tutors with the VLE and may help reduce time especially in the planning of e-learning which requires dedicated time. However, these need to be timely and appropriate and should not be seen as a panacea.

Students are also restricted in the amount of time that they can give to their studies. However, both postgraduate and undergraduate students need time to familiarise themselves with online learning especially if they are adjusting to a new way of learning and organising themselves for this, for example, organising easy access to a computer. Tutors need to be sensitive to this and to support students so that they do not waste precious time, for example, by posting inappropriate postings which are too lengthy and lack focus.

Rigour

Qualitative research is often criticised for its lack of rigour and may be perceived as anecdotal (Lacey and Luff, 2001). Throughout our data collection (specifically drawn from a range of sources (Lacey and Luff, 2001)) and analysis we have sought to demonstrate that our methods are reproducible, reliable and consistent. For example, Figure 3 in the methodology section, provides an audit trail showing the steps taken in producing our results. Throughout the data analysis the two researchers sought to cross-check the coding and emergent themes. Regular meetings were held to discuss the coding and procedures and on several occasions, the researchers returned to the original transcripts. An expert in qualitative research analysis was also called upon to check the data analysis. We were also keen to avoid any 'tutor' effect and therefore:

- a) tutors who taught the modules did not conduct the interviews or the focus groups but a second party was engaged
- b) data collected was anonymised as much as possible, for example, students referred to by a number in the interviews and focus groups
- c) data analysis involved two researchers, one who was not involved in the delivery of either of the modules.

However, we accept that there was some 'pressure' on students to attend since tutors were involved in the original presentation about the research and encouraging participation. Also, students were aware that the final report would be read by their tutors and would impact on their future deployment of WebCT.

OBJECTIVES OF THE PROJECT REVISITED

Finally we return to the objectives of the project and review progress towards fulfilling these goals.

Objective	Evidence of achievement
<p>1. To provide an overview of the literature on the use and value of VLEs in the health sciences. This will focus specifically on initial learner attitudes to Information Technology in learning</p>	<p>See literature review which provides an overview of e-learning especially in the health sciences</p>
<p>2. To conduct a study exploring students' reactions to, and participation in a VLE during the lifetime of the project</p>	<p>The study focusses on two groups of students and their reactions to the introduction of a VLE</p>
<p>3. To identify issues in preparing students in the use of a VLE drawn from diverse groups</p>	<p>In the discussion issues that tutors may address when deploying a VLE are considered</p>
<p>4. To evaluate the findings of the study which will:</p> <ul style="list-style-type: none"> • Review students attitudes to the use of a VLE in physiotherapy programmes • Highlight individual, social and technical barriers for the meaningful implementation of the VLE from the student perspective • Consider the potential for VLEs for the health science community as a whole as well as the individual lecturer 	<p>See discussions section. There will be a recommendations section in the forthcoming article.</p>
<p>5. To raise awareness, throughout the duration of the project, of the potential roles of VLE in improving students learning</p>	<p>Throughout the study the authors have sought to raise awareness of the project by:</p> <ul style="list-style-type: none"> • Updating sessions with tutors who are involved with future iterations of the modules • Briefing sessions to physiotherapy staff including a PowerPoint Presentation • Proposed publication in Physiotherapy • Publication of report on the LTSN/HE Academy website

CONCLUSION

By introducing the 'e' into learning we have brought into sharp focus basic assumptions held by our students and tutors about what a university education entails. From the undergraduate perspective we see a strong content-driven, assessment-focused approach to learning which is highly dependent on the tutor for providing structure and guidance. Knowledge is an external artefact and something to be collected and absorbed. This is problematic in the age of the knowledge worker when information may have a shelf-life of months and at best years. Also, after qualifying, students will need to be independent learners who are intrinsically motivated in their professional lives in order to successfully function in a lifetime of work supported by a lifetime of study. In the main, off-campus postgraduates have a different perspective on learning which has been developed through their life experience and in their working, professional lives but this cannot be assumed to apply to all postgraduate students.

In our perpetually changing academic environment with tutors coping with increasing student numbers, more diverse students and more administrative demands, it is very easy to use the VLE as a one-stop shop for students especially when this is specifically requested by students. It may therefore be timely to reflect on our current deployment of e-learning through a VLE and consider how it may assist our students in moving away from their very traditional perspective of learning to become independent learners confident in their ability to engage with a rapidly changing professional world. As Richardson states:

“Somewhat expected was the finding that online instruction promoted more independent learning, which in turn facilitated the pursuit of ongoing lifelong learning.”
Richardson (2004) p114.

As a consequence, for tutors and students, moving to the online environment can be a challenging, uncomfortable and daunting experience. For tutors, the transition to the online learning is not a quick fix and involves considerably more commitment than just 'dumping' materials online. It needs extensive planning and teamwork (Kubala 1998) which if ignored can lead to more problems, for example, it may lead to overload for students. As Carroll-Barefield (2004) states:

“Jumping in with both feet is not for timid souls. Internet offerings require large amounts of time in the preparation of course materials. Everything must be viewed in a global sense for an entire semester at the outset. ... You cannot wing it.”

Clearly the online environment can increase motivation, for example, our postgraduate tutors stated that they felt compelled to log on and find out what was happening and contribute. However, this 'jumping in with both feet,' should be rewarded by an institution, as suggested by HEFCE (2005) in the appropriate rewards structures. Other incentives may be possible, for example, at McGill (Masi and Winer, 2005) where tutors who agree to attend a WebCT workshop and create a minimal WebCT presence are eligible for a 50% subsidy on a designated laptop.

Finally, as part of any predominantly qualitative research, it must be accepted that this discussion has a reflexive voice. Both of the researchers in this project have been actively involved with higher education and e-learning for over ten years and hence these discussions will inevitably be coloured by their experience. The research methods used sought in a number of ways to include rigour but accept that the researcher is not neutral and cannot entirely disassociate themselves from the subject area placed under the microscope. Furthermore, this study was based on a small sample of students drawn from

two cohorts representing a minority of physiotherapy students in a much wider pool of health science students. The experiences of these students may not represent that of all health science students. However, the findings when related to the literature review may help to provide us with some insights into students' attitudes to e-learning with a VLE and provide some guidance for tutors who are moving to this new environment. As stated in our proposal the overall aim of the project was not to produce knowledge but to improve practice.

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APPENDIX 1: APPLICATION FOR FUNDING TO THE LTSN

APPLICATION FOR MINI-PROJECTS FUNDING – CRITICAL REVIEWS

1. Title of project

How do diverse groups of learners in the health sciences respond to a new virtual learning experience?
--

2. Project leader (CV in Appendix 3)

Title	Ms	Forename	Susi	Surname	Peacock
Current post	Learning Technology Advisor				
Full address	Queen Margaret University College (QMUC) Centre for Academic Practice Queen Margaret University Clerwood Terrace Edinburgh				
Telephone	0131 317 3722			Fax	0131 317 3730
E-mail	Speacock@qmuc.ac.uk				

3. Project partners (if any) (CV in Appendix 4)

Title	Dr	Forename	Marie	Surname	Donaghy,
Current post	Head, School of Health Sciences				
Full address	Queen Margaret University College (QMUC) Department of Physiotherapy Leith Campus Duke Street Edinburgh				
Telephone	0131 317 3640			Fax	
E-mail	mdonaghy@qmuc.ac.uk				

4. Description of project

Aims

The aim of this research is to:

- Investigate learners' response to their first exposure to a new learning experience in a Virtual Learning Environment (VLE)
- Examine learners' attitudes to the VLE as an effective learning environment through the project
- Compare and contrast attitudes to a VLE in two different physiotherapy programmes.

We would like to establish how learners respond to the VLE as a learning environment. Also, by collecting and analysing information about what learners perceive is effective for them within a VLE, we aim to assist staff to ensure that their learners make a smooth, rapid and effective transition to the new learning medium.

Objectives

This research will provide a detailed analysis into the experience of two specific and differing physiotherapy student cohorts who are new to using VLEs in the learning experience. We aim to:

- Provide an overview of the literature on the use and value of VLEs in the health sciences. This will focus specifically on initial learner attitudes to Information Technology in learning
- Conduct a study exploring students' reactions to, and participation in a VLE during the lifetime of the project
- Identify issues in preparing students in the use of a VLE drawn from diverse groups
- Evaluate the findings of the study which will:
 - Review students attitudes to the use of a VLE in physiotherapy programmes
 - Highlight individual, social and technical barriers for the meaningful implementation of the VLE from the student perspective
 - Consider the potential for VLEs for the health science community as a whole as well as the individual lecturer
- Raise awareness, throughout the duration of the project, of the potential roles of VLE in improving students learning.

Outcomes

The project outcomes will be:

- Good practice guidelines for staff to assist them in supporting diverse learners moving to a new learning medium. These will draw upon the experience of the project and the literature review
- A project report highlighting key issues for the meaningful deployment of a VLE, particularly for diverse learners
- Increased awareness of the potential of VLEs in the health sciences through dissemination via conferences, publications and a website.

Areas of teaching and learning

Over the last five years, there has been extensive deployment of VLEs in tertiary education in the United Kingdom (Furl, 2002). Many programmes in health science related subjects are planning to or are using information technologies including Virtual Learning Environments (VLEs) in learning for mixed mode delivery, distance learning or continuing professional development (Moule, Gilbert and Chalk, 2001). Much research suggests that information technologies especially VLEs have the potential to possibly provide a dynamic, interactive and exciting personal learning experience (Jonassen et al, 1999). A range of benefits and issues from the student and staff perspective has already been identified (Britain, 2001, Williams, 2002) which indicate that VLE may improve the learning experience.

Some research has focused on general undergraduate student use of information technology and PC ownership (Breen, Lindsay, Jenkins and Smith, 2001) and general attitudes to information technology (Frans, 2000). There has, however, been limited research in the health sciences into students' initial attitudes to the role of a VLE and if and how this impacts on their learning. Some studies would suggest that this does have an impact especially since many students experience anxiety about online learning in the early stages of module delivery (Hughes and Daykin, 2002). Also, students have demonstrated that although they may be comfortable with and using information technologies, they have little understanding about the role for information technologies in learning (Wojtas, 2003).

This study will focus specifically on two contrasting student cohorts using the VLE:

- What are their attitudes towards using Information Technology for learning at the beginning of a module?
- What are their attitudes towards using Information Technology for learning, especially VLEs, at the end of a module?
- Are there any significant differences in attitudes to Information Technology for learning, especially the VLE, between student cohorts?
- Are some students less receptive to VLEs than others and are there any notable differences between males, females, mature and international students?
- How can we provide staff with guidance to ensure that the student learning experience is positive from the initial use of a VLE, especially for diverse learners?

Methodology

The study will be undertaken from an action research perspective with the fundamental aim of improving practice rather than producing knowledge (Elliott, 1991). It will aim to bring about change and to promote reflection amongst practitioners (Middlewood, 1999). In the spirit of action research, it is iterative in nature, building on the work of an initial trial currently being undertaken at QMUC. Findings from the project, will be relayed to staff involved in the project for future changes to module deployment.

The research approach will employ multiple research methods combining both quantitative and qualitative approaches, drawn from both the student and staff perspective. This will permit triangulation of data (Robson, 2002), which can be reviewed with respect to current research into the deployment of VLEs especially in health sciences.

Student questionnaires will be used to gather data about attitudes to and confidence in using information technology (especially for learning) at the beginning of the semester. (An example of a draft initial questionnaire is provided in Appendix 1; this will provide the basis for the first questionnaire). At the end of each module, students will also be asked to complete a questionnaire about their attitudes to the use of information technology for learning and the VLE. As stated by Robson, this will provide a straightforward, practical approach to collecting attitudinal data. This data can then be used to form the basis of focus groups where ideas can be clarified and explored in more depth. Individual interviews may also be used for key students who may provide further insights. Data will also be gathered from the VLE about student usage.

Two complimentary physiotherapy programmes at QMUC (further information available in Appendix 2) will be involved in the study:

- M.Sc in Physiotherapy (post-registration)
- BSc (Hons) in Physiotherapy (first year)

These will provide an ideal opportunity to evaluate the impact and of VLE's on students who have not previously been exposed to this approach to learning and teaching.

In year one of the BSc (Hons) in Physiotherapy, the Psychology module will be using the VLE with the aim of facilitating peer and independent learning. This will be achieved through a range of approaches which will include students working in pairs to post onto the discussion board a summary of the lecture / tutorial / laboratory experiment drawing on the empirical evidence and questioning the common-sense view of the world. Discussion points will be highlighted by students and debate encouraged. In addition there will be links to the American Bernstein web sites, multiple-choice questions, additional laboratory experimental work; and further reading. The purpose is to encourage first year undergraduate students to engage in active learning with specific tasks to complete and from which to obtain feedback. During the trial, this module has already been delivered using the VLE to a limited extent. The learning technology advisor and lecturer are currently working on extending the module prior to deployment in September 2003.

Programme modules in Paediatric Physiotherapy in the MSc in Physiotherapy will require students to use the VLE to synthesise and summarise set aspects of directed learning and to share their interpretation with peers and obtain and give feedback. They will use a discussion forum for peer learning which will be mediated by outside visiting lecturers. The site will also be linked to relevant key sites to widen breadth of knowledge and research on the topic. The purpose is to engage mature learners in peer learning and to facilitate new ways of thinking. The lecturer has recently attended a module in network technologies and is currently developing this module for deployment in September 2003. It should be noted that neither of these modules requires students to use the VLE but both provide extremely compelling reasons to do so.

The profile of learners enrolled on these two programmes is particularly interesting. It is a predominantly female population (mirroring many health science programmes) with a high percentage of international students (14%) and mature student learners. Modes of study, however, are strikingly different. For the masters, part-time students attend three one-week blocks across the academic year, but most of their study is undertaken at a distance and in their home country. In comparison, the undergraduate experience is mainly traditional on-campus delivery. Since the masters students have enrolled on a distance learning programme, it is anticipated that they will have a more extensive use of the VLE and a different attitude to using a VLE as opposed to on-campus students.

Evaluation

Evaluation data will be drawn from:

- Questionnaires: students
- Focus Groups: students
- Interviews: staff and identified key students
- VLE data showing student usage

and will be related and analysed in relation to current literature.

Students will be asked to:

- Complete a questionnaire at the beginning and end of the module. This will focus on attitudes and perception to online learning and will provide comparative data at the individual student level.
- Attend focus groups. These will be held with the student cohorts at the end of each of the modules. They will draw on the results from the questionnaire and aim to provide in-depth information about student attitudes and perception.

In addition, throughout the lifespan of the modules, student activity in WebCT will automatically be monitored. This will provide basic information about frequency of student access to WebCT and postings and readings in discussion boards. It is hoped, through triangulation of the student data collated, to identify specific students who will be able to

provide valuable insights and understanding from the student perspective. These would be interviewed on an individual basis from the different student cohorts.

Staff will be asked to attend a short interview about the use of WebCT, induction to WebCT, perceived student attitudes to online learning and improving the transition to a new learning environment.

The focus group discussions and interviews will be transcribed verbatim and thematic analysis of these will be undertaken to identify emergent areas. The responses to the questionnaires will be analysed in SPSS, which will provide individual and group comparisons. Data on student activity in the VLE will be collated in Excel and SPSS.

Timetable for Activity

Summer 2003	Work with staff to extend and further develop WebCT modules Start literature review Development of project website Refine student questionnaires from pilot project
September 2003	Students complete questionnaire (first year and masters) Analysis of students' questionnaires and preparation for focus groups Launch WebCT modules Start monitoring of online activity of students
October 2003	Collate and analyse student data (first year and masters)
January - February 2004	Interview undergraduate staff Undergraduates complete second iteration of questionnaire Analysis of students' questionnaires and preparation for focus groups Focus group for undergraduate students Interview key undergraduate students
March 2004	Collate and analyse data from interviews, questionnaires and focus groups for first year students
April 2004	Postgraduate students complete questionnaire Prepare and hold focus group for postgraduate students Interview key postgraduate students
May 2004	Interview postgraduate staff
June 2004 – August 2004	Complete analysis of data Feedback event to undergraduate and postgraduate staff using WebCT at QMUC Development of guidelines for staff
September - October 2004	Dissemination events: ALT-C and Chartered Society of Physiotherapists Congress

Dissemination

The analysis of the results will be disseminated to the sector through publications, conferences and a project website, which will be updated throughout the project.

Targeted Conferences:

Chartered Society of Physiotherapists Congress, Birmingham, October 2003

Association for Learning Technology, Sheffield, September 2003 (<http://www.alt.ac.uk>)

Targeted Publications:

Academic papers:

Innovations in Education and Training International

(<http://www.tandf.co.uk/journals/routledge/14703297.html>)

Physiotherapy Theory and Practice

Articles:

ALT-N, Newsletter for Learning Technologies (<http://www.alt.ac.uk>)

5. Budget

Time release	
1 principal researcher (Physiotherapy) 8 days interviews, analysis of results (£250 per day)	£1800
1 researcher (CAP) 2 days interviews, analysis of results 2 days literature review 3 days Project Management (£200 per day)	£1400
Administrative/secretarial support Transcribing 2 focus groups and 12 interviews, (4 days secretarial staff) (£100 per day)	£400
Other assistance (please specify) Creation and administration of VLE and Website (CAP) (3 days) (£200 per day)	£600
Travel and subsistence (conferences: ALT-C and	£600
Materials	£200
TOTAL	£5000

6. Name and signature of project contact

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7. Signature(s) of Head(s) of Department(s) in which project is to be undertaken

Heads of participating departments should sign indicating their support for the application and confirming that the grant will not be top-sliced.

Name	Department/institution
a)	
b)	
c)	
d)	

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APPENDIX 2: INTERIM REPORT TO THE LTSN

Interim Report for LTSN Health Sciences

How do diverse groups of learners in the health sciences respond to a new virtual learning environment? Miniproject: phase 4

Summary

Over the last six months, the team has launched two modules in Queen Margaret University College's virtual learning environment (WebCT) for two different groups of physiotherapy and occupational therapy students: undergraduate and master's. During the summer 2003, staff worked to develop and extend these modules to use WebCT for blended learning. The students were shown how to use WebCT in September 2003 and asked to complete an initial questionnaire plus an ethics consent form. The undergraduate students have completed their use of WebCT and consequently filled in a second questionnaire. The results of all questionnaires have been collated in SPSS and Word. Currently focus groups and interviews are being organised with the first year cohort of students. Master's students are still using WebCT and will be asked to complete a second questionnaire in April 2004 and attend focus groups and interviews. Telephone and face-to-face interviews are being organised for visiting lecturers and module co-ordinators over the next few months.

A literature review has been started and focusses on e-learning, the use of Virtual Learning Environments and student attitudes in health sciences. A searchable database has been created using Reference Manager. In preparation for dissemination of the project's results, a website has been launched at <http://ctserv.gmuc.ac.uk/online/DELHS/>. It is hoped that this will be one avenue of dissemination for the project as well as presentations and poster sessions. The website will be updated towards the end of the project.

The project is now focussing on gathering further student and staff data as well as developing:

- A good practice guide for staff in health sciences
- A final report focussing on good practice in the use of VLEs

The team will also be developing the website and disseminating the results of the project.

February 2004

Julie Hooper
Susi Peacock
Frederike Van Wijck

INTRODUCTION

The aim of this interim report is to:

- Provide an overview of work completed in the last six months (August 2003 – February 2004)
- Highlight key changes and developments to the project in the last six months
- Consider current and future challenges
- Review work undertaken with regard to stated outcomes of the project.

OVERVIEW OF WORK UNDERTAKEN AUGUST 2003 – FEBRUARY 2004

The following table shows the anticipated activity outlined in the Project Proposal, 2003 (column 2) and actual activity undertaken by the team (column 3).

Time	Planned activity in project proposal	Actual activity
Summer 2003	Work with staff to extend and further develop WebCT modules	Throughout the summer, we developed the WebCT Modules. See Appendix 1
	Start literature review	A literature review has been started with over 50 references in Reference Manager referring to the use of e-learning and VLEs in health sciences
	Development of project website	Website launched at http://ctserv.qmuc.ac.uk/online/DELHS/
	Refine student questionnaires from pilot project	Questionnaires reviewed and extended to include further questions. See Appendix 2
September 2003	Students complete questionnaire (undergraduate and masters)	Master's and undergraduate students completed questionnaire with signed consent forms from students. They were provided with an overview on the project. See Appendix 3. Appendix 4 shows consent form.
	Analysis of students' questionnaires and preparation for focus groups	Questionnaires collated in SPSS and Word <i>Still need to finalise details on focus groups</i>
	Launch WebCT modules	WebCT modules launched
	Start monitoring of online activity of students	Monitoring of students activity in WebCT for undergraduates and master's which will be transferred into Excel
October 2003	Collate and analyse student data (undergraduate and master's)	Some analysis but further required prior to focus groups.

January - February 2004	Interview undergraduate staff	Date planned and draft interview outlined prepared (see appendix 5).
	Undergraduates complete second iteration of questionnaire	Completed and in SPSS and Word
	Analysis of students' questionnaires and preparation for focus groups	In progress
	Focus group for undergraduate students	In the process of organising
	Interview key undergraduate students	In the process of organising
	Telephone interview first visiting lecturers involved in master's module	In the process of organising

SECOND PART OF PROJECT		
March 2004	Collate and analyse data from interviews, questionnaires and focus groups for undergraduate students	
April 2004	Postgraduate students complete questionnaire in WebCT Prepare and hold focus group for postgraduate students Interview key postgraduate students Interview postgraduate staff	Date planned for students to complete questionnaire and attend focus group Organising final details of focus group
May 2004 – August 2004	Complete analysis of data Feedback event to undergraduate and postgraduate staff using WebCT at QMUC Development of guidelines for staff Write report for LTSN	
September - October 2004	Dissemination events: ALT-C and Chartered Society of Physiotherapists Congress	

Other activities planned but not on the original project proposal:

- Significant overall and updating of website
- Working with and supporting Visiting Lecturers
- Interviewing Visiting Lecturers

DEVELOPMENTS TO THE PROJECT

This section discusses the developments and changes to the anticipated project plan. We would welcome comments from the LTSN Health Sciences regarding these changes if further clarification is required.

Questionnaire development

During the summer, the team developed an improved version of the questionnaire for students to complete. This focussed on obtaining more personal data about age, country of origin and first language.

Student data collection

To date, student questionnaires have been collated in SPSS with open-ended comments being collated in Word. These include:

	Completed first questionnaire	Completed second questionnaire	Matched
Undergraduates	32	20	20
Master's	10		

The Master's students will complete their second questionnaire on WebCT which will be available from late March 2004.

Only matched questionnaires will be used for the final analysis.

Changes to student data collection

An enhancement from the pilot of this study is that students, before completing the second questionnaire, are presented with their first questionnaire results. They are then asked to reflect on these and then to complete the second questionnaire. The benefit of this is to allow students to reflect on their changes of attitude towards a VLE after having engaged with it for a period of study.

Changes to staff data collection

It had been anticipated that the two module co-ordinators would be interviewed after the modules had been delivered. In the M.Sc module, there are several visiting lecturers who are responsible for sections of the module. Hence all four of these lecturers plus the module co-ordinator will be interviewed. In the case of some of the visiting lecturers telephone interviews will be conducted and transcribed.

Literature review focus

The focus of the literature review is to 'provide an overview of the literature on the use and value of VLEs in health sciences.' (Project proposal, 2003) Many articles, however, focus on what could be termed e-learning which sometimes encompasses the use of VLEs. VLE-usage is increasing in the UK but not all articles as yet always consider the use of a VLE specifically. Also, some of the articles included in the review have been written in the late 1980s and early 1990s and describe early initiatives of the use of Computer Aided Learning (CAL) in health sciences. After consideration, it has been decided by the team to permit both types of reference for completeness.

CONCERNS

Currently there are several concerns for the project team:

- Smaller student numbers in the master's cohort. It had been anticipated that the cohort would be larger, approximately 12 – 15 students. However, only 10 students are enrolled on the module
- Lower than anticipated returns on second questionnaire by undergraduate students due to lack of attendance at the final class
- Lack of experience in the online environment of the visiting lecturers. The two module co-ordinators are experienced users of WebCT but the visiting lecturers are new and this will probably reflect in some of the responses collated.

FUTURE CHALLENGES

Literature review

Although the literature review has proved extensive in the area of the use of e-learning in health sciences, the articles tend to have a strong case study focus. Also, there is somewhat more limited literature on student attitudes and differing student attitudes to e-learning in the health sciences. We have anecdotal evidence that this differs but the team would welcome any suggestions from the LTSN Health Sciences for further references in this specific area especially from outwith the United Kingdom.

Student response to attending focus groups

Although several undergraduate students have indicated that they are willing to attend a focus group and/or be interviewed, there is concern that the actual numbers attending will be limited. Currently the module co-ordinator is organising the focus group with the students and there is a possibility of using a financial incentive to encourage attendance.

Dissemination

Although the website has been developed, it is only one mechanism for disseminating the findings of the project. In the next few months a proposal will be made to the Chartered Society of Physiotherapists Congress. Other dissemination avenues will include:

- Association for Learning Technology Conference, September 2004
- And possibly LTSN Health Sciences Events

OUTCOMES OF THE PROJECT

The intended outcomes of the project are:

Anticipated outcome 1
'Good practice guidelines for staff to assist them in supporting diverse learners moving to a new learning medium. These will draw upon the experience of the project and the literature review.'
Currently we have been collating data about our own experiences of using a VLE with students in two different cohorts in physiotherapy and occupational therapy. This will be linked to the literature to provide good practice guidelines for staff in the health sciences and focus on dealing with a range of diverse learners
Anticipated outcome 2
'A project report highlighting key issues for the meaningful deployment of a VLE, particularly for diverse learners'
Two modules, with very diverse use of WebCT, have been launched and used with two distinct student groups. We are gathering data about student and staff perceptions of using the VLE and will draw upon this to highlight the key issues in using a VLE
Anticipated outcome 3
'Increased awareness of the potential of VLEs in the health sciences through dissemination via conferences, publications and a website.'
Our current dissemination plan is focussed on two conferences and extending the website. With the assistance of the LTSN, we hope to expand this.

CONCLUSION

It is hoped that the findings of this study will enable academic staff to gain an understanding of how diverse groups of students with different learning needs, respond to a new virtual learning environment. The students' attitudes towards the WebCT component of the modules will be compared at the start and then at the end of the study to determine whether or not it has enhanced their learning experience. The findings of the present will have important implications not only for the pattern of module delivery in the future but also in developing a good practice guide for staff on the use of VLEs.

Appendix 1: Development of WebCT Modules

Introduction to psychology: first-year module (September 2003 – December 2003)

In this module, WebCT is used to house tutorial, workshop and timetable information which is also provided in paper-format to the students. There are also links to the website for the core text, 'Psychology' by Bernstein, which is published by Houghton Mifflin. This website has online quizzes, experiments, weblinks and summaries of chapters. In addition, each student is asked to work in a pair and to provide a summary of a lecture, workshop or tutorial. This is submitted to the tutor via email for formative assessment prior to being published on the WebCT by the tutor. The students were shown how to use WebCT in late September 2003 and asked to log on to the system and navigate through the system.

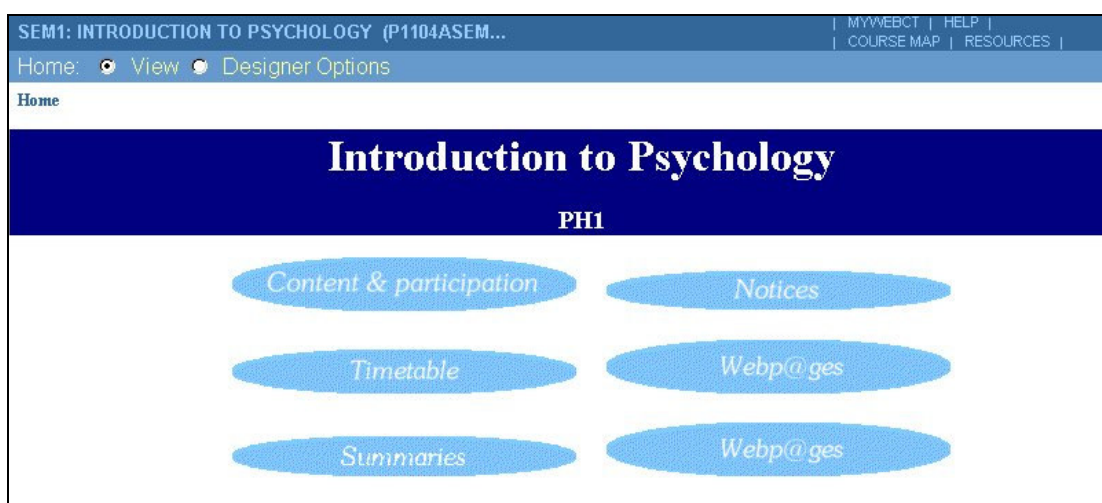


Figure 1: Diagram of WebCT module: Introduction to psychology

Paediatric physiotherapy and occupational therapy: a critical approach: Master's module (September 2003 – May 2004)

A number of resources have been made available through WebCT to the master's students. These include online articles via the HERON licensing agreement, study block information (made available online at an appropriate time through the module), a calendar with key dates including assessment hand-in, a list of relevant web links and case study material. Students also use the online discussions to contact the visiting lecturers throughout the module. They are posted scenarios and queries to respond online as a group and individually. There is also a student café and a private facilitators area where the lecturers can talk online to each other. In addition, the assessment tool is used for formative assessment. Students submit their formative assessment and this is accessed by the visiting lecture. Marks and comments are sent to the students individually through the tool.

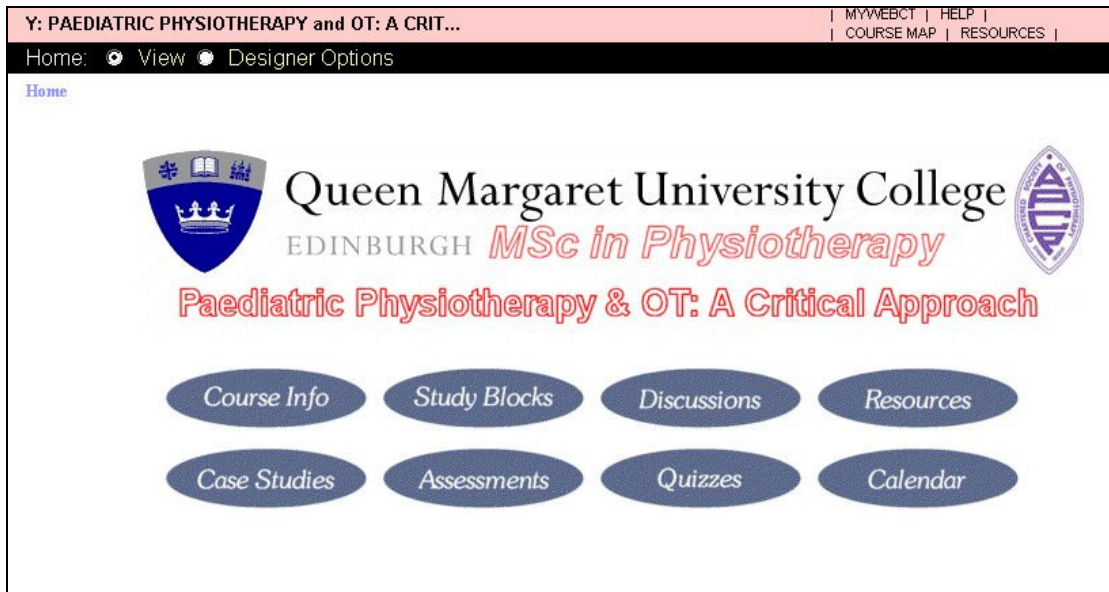


Figure 2: Diagram of WebCT module: Paediatric physiotherapy and occupational therapy

Appendix 2: Amended student questionnaire



Queen Margaret University College
EDINBURGH

Study: How do diverse groups of learners in the health sciences respond to a new virtual learning experience: QUESTIONNAIRE 1 - September/October 2003

QMUC is investigating the potential of Virtual Learning Environments to enhance student learning. To help in this investigation we would be grateful if you could complete this questionnaire. Please remember that all data will be treated in confidence. Thank You.

1) Personal Information - Please could you complete the following, placing a cross (X) in the appropriate box when

1.1 Matriculation Number 1.2 Male Female

1.3. Age 18 - 21 22 -25 26 - 30 31 - 35 36 - 40
 41 - 45 46 - 50 51 - 55 56 - 60 over 60

1.4 My home country is

1.5 My first language is

1.6 Before coming to QMUC, have you had any training in using computers and/or the Internet?

Yes No If yes, please provide details on training and qualifications (if appropriate)

2) Using the scale presented below, please circle the letter option that best describes how often you have used the following over the last year:

At least once a week	Circle	a
At least once every two weeks	Circle	b
At least once every month	Circle	c
Every 2 to 3 months	Circle	d
Less often	Circle	e
Never	Circle	f

2.1 The Internet for email (eg yahoo, hotmail, etc.)

	At least once		←————→			never
	a week					
For fun/leisure	a	b	c	d	e	f
For study	a	b	c	d	e	f
For work	a	b	c	d	e	f
Other (please specify)						

2.2 The Internet for information searching

	At least once		←————→			never
	a week					
For fun/leisure	a	b	c	d	e	f
For study	a	b	c	d	e	f
For work	a	b	c	d	e	f
Other (please specify)						

2.3 Chat Rooms, Discussion Forums, Bulletin Boards on the Internet

	←-----→					
	At least once a week					never
For fun/leisure	a	b	c	d	e	f
For study	a	b	c	d	e	f
For work	a	b	c	d	e	f
Other (please specify)						

2.4 CD-ROMs (not including music)

	←-----→					
	At least once a week					never
For fun/leisure	a	b	c	d	e	f
For study	a	b	c	d	e	f
For work	a	b	c	d	e	f
Other (please specify)						

3) Using the same scale, please circle the letter option that best describes how often you have accessed the Internet from any of the following locations in the last year?

- At least once a week Circle a
- At least once every two weeks Circle b
- At least once every month Circle c
- Every 2 to 3 months Circle d
- Less often Circle e
- Never Circle f

	←-----→					
	At least once a week					never
Home	a	b	c	d	e	f
An Internet café	a	b	c	d	e	f
A place of work	a	b	c	d	e	f
A place of study	a	b	c	d	e	f
A Library (not at work/study)	a	b	c	d	e	f
Other (please specify)	a	b	c	d	e	f

4) What do you most like about using the Internet? (You may state more than one like)

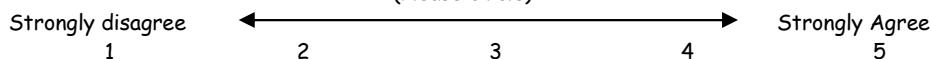
5) What do you least like about using the Internet? (You may state more than one dislike)

6) Using the scale presented below, please circle the number that best describes how you feel about the following statements.

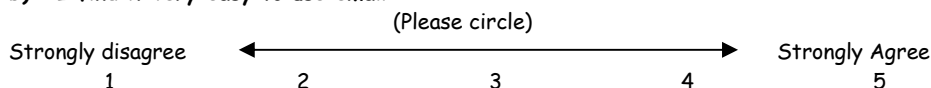
Scale

- | | | |
|----------------------------|--------|---|
| Strongly disagree | Circle | 1 |
| Disagree | Circle | 2 |
| Neither Agree nor Disagree | Circle | 3 |
| Agree | Circle | 4 |
| Strongly Agree | Circle | 5 |

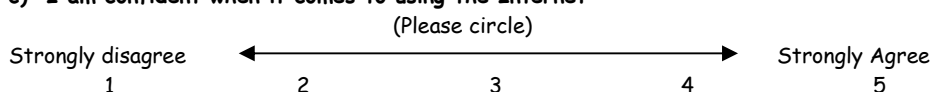
a) I have very limited skills in using packages like Word and Excel
(Please circle)



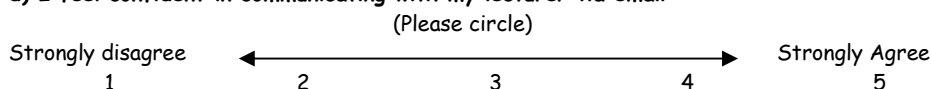
b) I find it very easy to use email



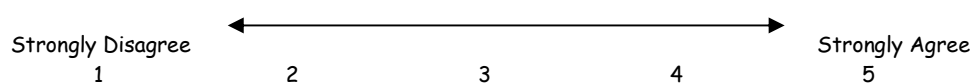
c) I am confident when it comes to using the Internet



d) I feel confident in communicating with my lecturer via email



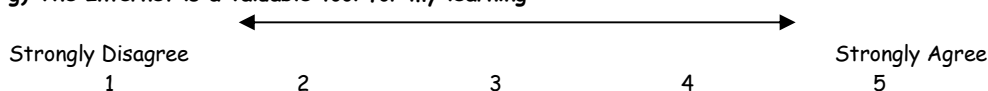
e) I am not sure about posting messages in an electronic discussion area, which will be read by other members of my class



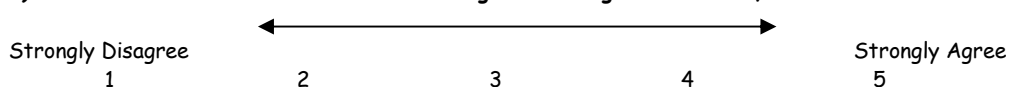
f) I would use the following materials on a regular basis if my lecturer published them on the web:

	Strongly Disagree				Strongly Agree
Diagrams	1	2	3	4	5
Glossary	1	2	3	4	5
Extra resources	1	2	3	4	5
Links to other websites	1	2	3	4	5
Self-test quizzes	1	2	3	4	5
Summaries of lectures	1	2	3	4	5
Videos	1	2	3	4	5
Online discussions	1	2	3	4	5

g) The Internet is a valuable tool for my learning



h) I would like to make more use of technologies including the Internet, email and CD-ROMs in my learning



Do you have any further comments about technology (PCs, Internet, email, CD-ROMs) in your studies

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE. If you have any further questions, please contact Susi Peacock on speacock@qmuc.ac.uk

Appendix 4: Consent form

SUBJECT INFORMATION SHEET

Title of Study: An investigation into the response of diverse groups of learners in the health sciences to a new virtual learning experience

October 2003

Dear physiotherapy and occupational therapy student

Julie Hooper, Frederike Van Wijck (physiotherapy) and Susi Peacock (Centre for Academic Practice) are conducting a research study to investigate students' attitudes to a virtual learning experience. This is being supported by the Learning, Teaching and Support Network for Health Sciences (<http://www.health.ltsn.ac.uk>). We wish to invite you to participate in this study. Participation is voluntary and you may withdraw from the study at any time and this will have no effect on your studies and your marks. Confidentiality will also be strictly maintained throughout the study.

All students in your module are being asked to complete a questionnaire in October 2003 and a second questionnaire at the end of the module. You may also be asked to participate in a focus group and/or interview. Voluntary participation will include:

- giving consent for the data in questionnaires to be used in the study
- participation in a Focus Group/interview at the end of the module. Focus groups will be audio-tape recorded for data analysis purposes. Tapes will be destroyed at the end of the research project.

Please be assured that all information provided in questionnaires and focus groups will remain confidential and you will not be identifiable in any reports or publications about the study.

If you have any queries, or would like further information about any aspect of the study, please contact us at:

Susi Peacock	Julie Hooper	Frederike Van Wijck
Centre for Academic Practice	Physiotherapy	Physiotherapy
speacock@qmuc.ac.uk	jhooper@qmuc.ac.uk	fvanwijck@qmuc.ac.uk
0131 317 3722	0131 317 3666	0131 317 3822



Queen Margaret University College
EDINBURGH

Consent Form

Title of study:

An investigation into the response of diverse groups of learners in the health sciences to a new virtual learning experience

I have read and understood the information sheet and this consent form. I have had an opportunity to ask questions about my participation.

I understand that I am under no obligation to take part in this study.

I understand that I have the right to withdraw from this study at any stage without giving any reason and this will have no effect on my studies or my marks.

I agree to participate in this study.

Name of subject: _____

Matriculation Number _____

Signature of subject: _____

Signature of investigators: _____

Date: _____

Further information is available from:

Susi Peacock	Julie Hooper	Frederike Van Wijck
Centre for Academic Practice	Physiotherapy	Physiotherapy
speacock@qmuc.ac.uk	jhooper@qmuc.ac.uk	fvanwijck@qmuc.ac.uk
0131 317 3722	0131 317 3666	0131 317 3822

Appendix 5: Draft interview plan

Name of staff

Date

Interviewer

Current WebCT Module

Staff Perceptions

1. What were your initial thoughts about using WebCT when it was suggested for this module? What were some of your concerns?
2. After having used WebCT, what do you think was the main advantages for you in using WebCT for this module?
3. After having used WebCT, what do you think was the main disadvantages for you in using WebCT for this module?
4. What planning/preparation did you do before using WebCT?

AREAS IN WEBCT?

Discussion tool

- Did you find it difficult to post/read messages?
- What was your first message?
- Did you use the tutor's private area – why/why not? Advs/disadvs?
- What did you want to achieve from the online discussions? Did you achieve it?
- What did the students gain from it?
- Did you think that you would go in more often?
- Would you use it in the future? How and why?

Content

- Where you involved in creating/developing any of the material that went into WebCT?
- How did you feel about your cv being in WebCT?
- Why did you publish the timetable? Do you think it has been useful?
- Do you think the students gained from having the timetable and materials for the study blocks online?

Electronic Resources

- Do you think there was any advantage to having articles available online?
- Any there any problems with linking to electronic resources/databases?
- Would it be useful to have an electronic version of some key articles from journals/magazines/newspapers?

Assessments

Where you involved with the formative assessment tool?
Advs/disadvs?

Other tools

Did you use the calendar?
Did it have any advs/disadvs?

5. Do you refer to WebCT in other documentation, in face-to-face sessions, in assessment feedback
6. Training
 - Did you find the training adequate? Would you have preferred more training/less/type of training?
 - Did you require any support from CAP? Was it appropriate?
7. How often did you plan to access your WebCT module during the semester and how often did you?
8. Are there any barriers for you personally accessing WebCT?
9. If you reflect on the last few weeks developing and running a module with WebCT, what do you think has been the main learning experience for you?
 - Is there anything that could be changed?
 - Could the support services have helped in any further way?
 - Could the department/institution have helped in any further way?
10. Has it impacted on your teaching style for this module? If so, in what way?
11. As a general indicator, how do you feel about your WebCT module now? (might want to give a scale 1 to 10)

Staff Perception of Student Reaction

What do you think the initial student reaction to WebCT was? Any differences between students?

Did the students mention any barriers to using WebCT?

Have they mentioned anything they would like in WebCT in the future?









Did the students make any comments about WebCT?

How often do you think they are using WebCT?

Would you like to encourage usage?

APPENDIX 3: PRESENTATION TO STUDENTS

<p>Introduction to the project</p> <p>Julie Hooper Susi Peacock Frederike Van Wijck</p>  <p>Queen Margaret University College EDINBURGH</p> 	<p>Overview</p> <ul style="list-style-type: none">▪ Information about the project▪ What do we want to find out?▪ What are the implications for you as learners?▪ What happens after the project?  <p>Queen Margaret University College EDINBURGH</p> 
<p>SLIDE 1</p>	<p>SLIDE 2</p>
<p>Background information</p> <ul style="list-style-type: none">▪ Most institutions in higher education in the UK are using technology in learning and teaching▪ Web pages, CD-ROMs, Internet resources▪ A lot of research how effective this or not but ...  <p>Queen Margaret University College EDINBURGH</p> 	<p>Aim of this project</p> <ul style="list-style-type: none">▪ How do different groups of students in the health sciences respond to technology in learning▪ How can we help lecturers to support their students who are using technology  <p>Queen Margaret University College EDINBURGH</p> 
<p>SLIDE 3</p>	<p>SLIDE 4</p>
<p>The project</p> <ul style="list-style-type: none">▪ The project lasts for one academic year▪ Building on a pilot▪ Involves two groups of students drawn from:<ul style="list-style-type: none">▪ First-year physiotherapy▪ Master's physiotherapy and occupational therapy▪ Funding from the Learning, Teaching Support Network for Health Sciences – http://www.health.ltsn.ac.uk  <p>Queen Margaret University College EDINBURGH</p> 	<p>What do we want to find out?</p> <ul style="list-style-type: none">▪ Confidence in using computers and the Internet when starting to study at QM▪ Access to computers▪ Attitudes to using computers/internet in learning and teaching and do they change?  <p>Queen Margaret University College EDINBURGH</p> 
<p>SLIDE 5</p>	<p>SLIDE 6</p>

<h3>What impact for you?</h3> <ul style="list-style-type: none">At the beginning of the module:<ul style="list-style-type: none">Sign a consent formComplete a questionnaireTowards the end of the module:<ul style="list-style-type: none">Complete a second questionnaireParticipate in focus groups – small incentive <p>NO IMPACT ON YOUR ASSESSMENTS</p>  <p>Queen Margaret University College EDINBURGH</p> 	<h3>What happens to the data?</h3> <ul style="list-style-type: none">Entered into SPSS and analysed - anonymousCollate commentsTranscribe focus groups and analyse  <p>Queen Margaret University College EDINBURGH</p> 
<p>SLIDE 7</p>	<p>SLIDE 8</p>
<h3>What happens to the data?</h3> <ul style="list-style-type: none">Reports and dissemination<ul style="list-style-type: none">Internal reportReport to our funders (LTSN)Presentations including Physiotherapy Congress in October 2004Peer reviewed paperSupport other lecturers using technology in the health sciences  <p>Queen Margaret University College EDINBURGH</p> 	<h3>Questions?</h3>  <p>Queen Margaret University College EDINBURGH</p> 
<p>SLIDE 9</p>	<p>SLIDE 10</p>

APPENDIX 4: SUBJECT INFORMATION SHEET

SUBJECT INFORMATION SHEET

Title of Study: An investigation into the response of diverse groups of learners in the health sciences to a new virtual learning experience

October 2003

Dear physiotherapy and occupational therapy student

Julie Hooper, Frederike Van Wijck (physiotherapy) and Susi Peacock (Centre for Academic Practice) are conducting a research study to investigate students' attitudes to a virtual learning experience. This is being supported by the Learning, Teaching and Support Network for Health Sciences (<http://www.health.ltsn.ac.uk>). We wish to invite you to participate in this study. Participation is voluntary and you may withdraw from the study at any time and this will have no effect on your studies and your marks. Confidentiality will also be strictly maintained throughout the study.

All students in your module are being asked to complete a questionnaire in October 2003 and a second questionnaire at the end of the module. You may also be asked to participate in a focus group and/or interview. Voluntary participation will include:

- giving consent for the data in questionnaires to be used in the study
- participation in a Focus Group/interview at the end of the module. Focus groups will be audio-tape recorded for data analysis purposes. Tapes will be destroyed at the end of the research project.

Please be assured that all information provided in questionnaires and focus groups will remain confidential and you will not be identifiable in any reports or publications about the study.

If you have any queries, or would like further information about any aspect of the study, please contact us at:

Susi Peacock	Julie Hooper	Frederike Van Wijck
Centre for Academic Practice	Physiotherapy	Physiotherapy
speacock@qmuc.ac.uk	jhooper@qmuc.ac.uk	fvanwijck@qmuc.ac.uk
0131 317 3722	0131 317 3666	0131 317 3822

APPENDIX 5: CONSENT FORM

CONSENT FORM



Queen Margaret University College
EDINBURGH

Title of study:

An investigation into the response of diverse groups of learners in the health sciences to a new virtual learning experience

I have read and understood the information sheet and this consent form. I have had an opportunity to ask questions about my participation.

I understand that I am under no obligation to take part in this study.

I understand that I have the right to withdraw from this study at any stage without giving any reason and this will have no effect on my studies or my marks.

I agree to participate in this study.

Name of subject: _____

Matriculation Number _____

Signature of subject: _____

Signature of investigators: _____

Date: _____

Further information is available from:

Susi Peacock	Julie Hooper	Frederike Van Wijck
Centre for Academic Practice	Physiotherapy	Physiotherapy
speacock@qmuc.ac.uk	jhooper@qmuc.ac.uk	fvanwijck@qmuc.ac.uk
0131 317 3722	0131 317 3666	0131 317 3822

APPENDIX 6: FRAMEWORK FOR CONDUCTING STUDENT FOCUS GROUP

Organisational details

Background to the project – ask students to read about the project

Explanation of consent form – these forms are kept in a filing cabinet in CAP

Facilitator – Sally some background about herself

Explanation of taping and using students' numbers

Scriber – Susi's role as writing down who said what

Four sections to the questions:

 General questions about IT in learning and teaching

 Specific questions about use of WebCT

 Changes to your attitudes to IT

 Future – use of IT in learning and teaching for them

Focus group areas to be covered

Section 1 – WebCT

At the beginning of the semester, you were given a demonstration of WebCT

Did you find that useful?

Did you use the documentation – yes, no, why not, improved?

Can you remember how you felt about it at that time?

Using WebCT

- did you have any problems accessing? (please probe)
- Did you contact lecturer/WebCT Administrator?
- What did you think about the design?
- How often did you access? Once a week/fortnight/month/ never – why?
- Why do you think some people accessed a lot less/more than others?
- Did it add anything to the module (i.e. did it offer anything above the standard lectures, tutorials and textbook material?)

Summaries

You were asked by your tutor to work in pairs and send her emails summarising a lecture, tutorial etc.

Did you do it?

What did you think about the value of the summaries?

Did you access others?

Advantages/disadvantages?

Link to Core texts

There were links to both editions of the core text.

Did you use?

Other areas on WebCT

What did you think about?

How often did you use?

Overall – what did you think about the use of WebCT in this module?

Would you want WebCT to be used in any other modules you are taking?

Do you have any concerns/hopes about the use of WebCT in future modules?

Section 2 – change

Do you think that using WebCT for this module has changed your ideas about IT in learning and teaching?

What caused the change?

Will change how you feel about using WebCT/IT for other modules?

Do you think it changes the way your learn?

Section 3 – attitudes to IT in learning and teaching

What do you think are the advantages/disadvantages of IT in learning and teaching for students?

What is it used for? What could it be used for?

Why are we using IT in learning and teaching now?

What do you think would be the advantages for your lecturers?

Are lecturers using it in the best ways to support your learning? If not, what could be improved?

Section 4 – future

What role do you think that IT will have in your education?

- at QMUC
- after QMUC

Could you provide some specific examples?

APPENDIX 7: FRAMEWORK FOR CONDUCTING STAFF INTERVIEWS

Name of staff

Date

Interviewer

Current WebCT Module

Staff Perceptions

1. What were your initial thoughts about using WebCT when it was suggested for this module? What were some of your concerns?
2. After having used WebCT, what do you think was the main advantages for you in using WebCT for this module?
3. After having used WebCT, what do you think was the main disadvantages for you in using WebCT for this module?
4. What planning/preparation did you do before using WebCT?

Areas in WebCT?

Discussion tool

- Did you find it difficult to post/read messages?
- What was your first message?
- Did you use the tutor's private area – why/why not? Advvs/disadvvs?
- What did you want to achieve from the online discussions? Did you achieve it?
- What did the students gain from it?
- Did you think that you would go in more often?
- Would you use it in the future? How and why?

Content

- Where you involved in creating/developing any of the material that went into WebCT?
- How did you feel about your cv being in WebCT?
- Why did you publish the timetable? Do you think it has been useful?
- Do you think the students gained from having the timetable and materials for the study blocks online?

Electronic Resources

- Do you think there was any advantage to having articles available online?
- Any there any problems with linking to electronic resources/databases?

- Would it be useful to have an electronic version of some key articles from journals/magazines/newspapers?

Assessments

Were you involved with the formative assessment tool?
Advantages/disadvantages?

Other tools

Did you use the calendar?
Did it have any advantages/disadvantages?

5. Do you refer to WebCT in other documentation, in face-to-face sessions, in assessment feedback
6. Training
 - Did you find the training adequate? Would you have preferred more training/less/type of training?
 - Did you require any support from CAP? Was it appropriate?
7. How often did you plan to access your WebCT module during the semester and how often did you?
8. Are there any barriers for you personally accessing WebCT?
9. If you reflect on the last few weeks developing and running a module with WebCT, what do you think has been the main learning experience for you?
 - Is there anything that could be changed?
 - Could the support services have helped in any further way?
 - Could the department/institution have helped in any further way?
10. Has it impacted on your teaching style for this module? If so, in what way?
11. As a general indicator, how do you feel about your WebCT module now? (might want to give a scale 1 to 10)

Staff Perception of Student Reaction

What do you think the initial student reaction to WebCT was? Any differences between students?

Did the students mention any barriers to using WebCT?

Have they mentioned anything they would like in WebCT in the future?

Did the students make any comments about WebCT?

How often do you think they are using WebCT?

Would you like to encourage usage?

APPENDIX 8: STUDENT QUESTIONNAIRE PART ONE



Queen Margaret University College
EDINBURGH

Study: How do diverse groups of learners in the health sciences respond to a new virtual learning experience: QUESTIONNAIRE 1 - September/October 2003

QMUC is investigating the potential of Virtual Learning Environments to enhance student learning. To help in this investigation we would be grateful if you could complete this questionnaire. Please remember that all data will be treated in confidence. Thank You. Personal Information - Please could you complete the following, placing a cross (X) in the appropriate box when

1.1 Matriculation Number

1.2 Male Female

1.3. Age 18 – 21 22 – 25 26 – 30 31 – 35 36 – 40
 41 – 45 46 – 50 51 – 55 56 – 60 over 60

1.4 My home country is

1.5 My first language is

1.6 Before coming to QMUC, have you had any training in using computers and/or the Internet?
 Yes No If yes, please provide details on training and qualifications (if appropriate)

2) Using the scale presented below, please circle the letter option that best describes how often you have used the following over the last year:

- At least once a week Circle a
- At least once every two weeks Circle b
- At least once every month Circle c
- Every 2 to 3 months Circle d
- Less often Circle e
- Never Circle f

2.1 The Internet for email (eg yahoo, hotmail, etc.)

	At least once a week		←————→		never	
For fun/leisure	a	b	c	d	e	f
For study	a	b	c	d	e	f
For work	a	b	c	d	e	f
Other (please specify)						

2.2 The Internet for information searching

	At least once a week ←————→ never					
For fun/leisure	a	b	c	d	e	f
For study	a	b	c	d	e	f
For work	a	b	c	d	e	f
Other (please specify)						

2.3 Chat Rooms, Discussion Forums, Bulletin Boards on the Internet

	At least once a week ←————→ never					
For fun/leisure	a	b	c	d	e	f
For study	a	b	c	d	e	f
For work	a	b	c	d	e	f
Other (please specify)						

2.4 CD-ROMs (not including music)

	At least once a week ←————→ never					
For fun/leisure	a	b	c	d	e	f
For study	a	b	c	d	e	f
For work	a	b	c	d	e	f
Other (please specify)						

3) Using the same scale, please circle the letter option that best describes how often you have accessed the Internet from any of the following locations in the last year?

- | | |
|-------------------------------|----------|
| At least once a week | Circle a |
| At least once every two weeks | Circle b |
| At least once every month | Circle c |
| Every 2 to 3 months | Circle d |
| Less often | Circle e |
| Never | Circle f |

	At least once a week ←————→ never					
Home	a	b	c	d	e	f
An Internet café	a	b	c	d	e	f
A place of work	a	b	c	d	e	f
A place of study	a	b	c	d	e	f
A Library (not at work/study)	a	b	c	d	e	f
Other (please specify)	a	b	c	d	e	f

4) What do you most like about using the Internet? (You may state more than one like)

5) What do you least like about using the Internet? (You may state more than one dislike)

6) Using the scale presented below, please circle the number that best describes how you feel about the following statements.

Scale

Strongly disagree

Disagree

Neither Agree nor Disagree

Agree

Strongly Agree

Circle 1

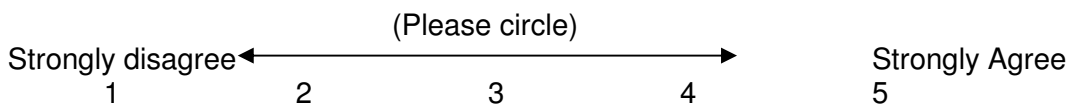
Circle 2

Circle 3

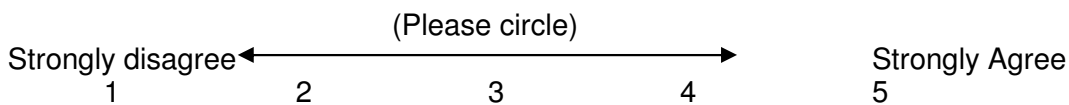
Circle 4

Circle 5

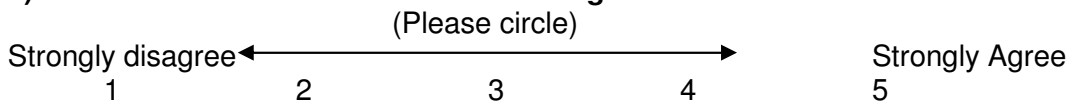
a) I have very limited skills in using packages like Word and Excel



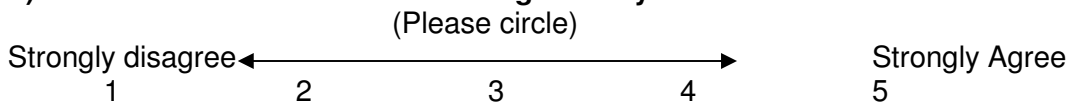
b) I find it very easy to use email



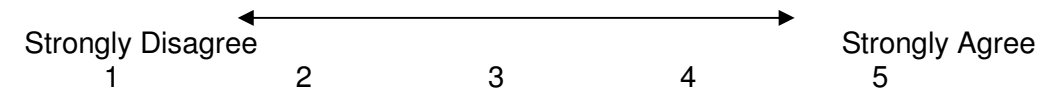
c) I am confident when it comes to using the Internet**



d) I feel confident in communicating with my lecturer via email**



e) ** I am not sure about posting messages in an electronic discussion area, which will be read by other members of my class



APPENDIX 9: STUDENT QUESTIONNAIRE PART TWO

(UNDERGRADUATE)



Queen Margaret University College

EDINBURGH

Using Virtual Learning Environments to Enhance Student Learning: QUESTIONNAIRE 2 (UNDERGRADUATE)

April 2004

Matriculation Number

.....

SECTION ONE

Please may we ask you for some feedback regarding the use of WebCT during your module.

1. Did you have any technical issues logging into WebCT:

	Greatest difficulty	Somewhat difficult	Occasionally problematic	No problems at all	Not appropriate
Logging In					
Slow response time					
Access to computers					
Access to the Internet					
Presentation and navigation					
Access from home					

2. Please could you indicate with a cross (X) how useful you found each of the areas in WebCT

Area in WebCT	Very useful	Useful	Not useful	Not useful at all	Did not use
Content					
Summaries					
Webpages					
Other					

3. The main advantages to me of WebCT are:

4. The main disadvantages to me of WebCT are:

SECTION TWO

At the beginning of the module, we asked you to complete a number of questions about using the Internet. May we ask you to return to these and let us know how you feel about these after this module. Using the scale presented below, please circle the number that best describes how you feel about the following statements.

Scale

- | | |
|----------------------------|----------|
| Strongly disagree | Circle 1 |
| Disagree | Circle 2 |
| Neither Agree nor Disagree | Circle 3 |
| Agree | Circle 4 |
| Strongly Agree | Circle 5 |

a) ** I am confident when it comes to using the Internet

(Please circle)

Strongly disagree ←————→ Strongly Agree **First**

Response

1 2 3 4 5

b) **I feel confident in communicating with my lecturer via email

(Please circle)

Strongly disagree ←————→ Strongly Agree **First**

Response

1 2 3 4 5

c) **I am not sure about posting messages in an electronic discussion area, which will be read by other members of my class

←————→

Strongly Disagree Strongly Agree **First**

Response

1 2 3 4 5

d) **I would use the following materials if my lecturer published them on the web:

First Response	Strongly Disagree					Strongly Agree				
Diagrams	1	2	3	4	5	1	2	3	4	5
<input type="checkbox"/>										
Glossary	1	2	3	4	5	1	2	3	4	5
<input type="checkbox"/>										
Extra resources	1	2	3	4	5	1	2	3	4	5
<input type="checkbox"/>										
Links to other websites	1	2	3	4	5	1	2	3	4	5
<input type="checkbox"/>										
Self-test quizzes	1	2	3	4	5	1	2	3	4	5
<input type="checkbox"/>										
Summaries of lectures	1	2	3	4	5	1	2	3	4	5
<input type="checkbox"/>										
Videos	1	2	3	4	5	1	2	3	4	5
<input type="checkbox"/>										

APPENDIX 10: STUDENT QUESTIONNAIRE PART TWO

(POSTGRADUATE)



Queen Margaret University College

EDINBURGH

Using Virtual Learning Environments to Enhance Student Learning: QUESTIONNAIRE 2 (POSTGRADUATE)

April 2004

Matriculation Number

.....

SECTION ONE

Please may we ask you for some feedback regarding the use of WebCT during your module.

5. Did you have any technical issues logging into WebCT:

	Greatest difficulty	Somewhat difficult	Occasionally problematic	No problems at all	Not appropriate
Logging In					
Slow response time					
Access to computers					
Access to the Internet					
Presentation and navigation					
Access from home					

6. Please could you indicate with a cross (X) how useful you found each of the areas in WebCT

Area in WebCT	Very useful	Useful	Not useful	Not useful at all	Did not use
Course info					
Online discussions					
Links to websites					
Calendar					
Study block materials					
Case studies					
Assessment area					
Quiz					

7. The main advantages to me of WebCT are:

8. The main disadvantages to me of WebCT are:

SECTION TWO

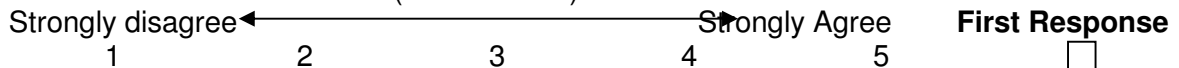
At the beginning of the module, we asked you to complete a number of questions about using the Internet. May we ask you to return to these and let us know how you feel about these after this module. Using the scale presented below, please circle the number that best describes how you feel about the following statements.

Scale

- | | |
|----------------------------|----------|
| Strongly disagree | Circle 1 |
| Disagree | Circle 2 |
| Neither Agree nor Disagree | Circle 3 |
| Agree | Circle 4 |
| Strongly Agree | Circle 5 |

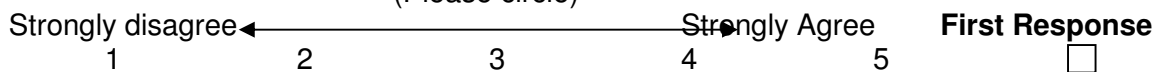
a) **I am confident when it comes to using the Internet

(Please circle)

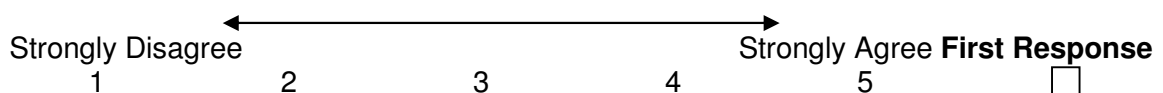


b) **I feel confident in communicating with my lecturer via email

(Please circle)



c) **I am not sure about posting messages in an electronic discussion area, which will be read by other members of my class



APPENDIX 11: MATRIX USED IN THE DATA ANALYSIS PROCESS

	Postgraduate Students	Undergraduate Students	Postgraduate Staff	Undergraduate Staff
1. Reactions to WebCT				
Initial				
Final impression				
2. Advantages of WebCT				
2.1 Learning and teaching 2.1.1 - Summaries 2.1.2 - Communication 2.1.3 - Support (peer/staff) 2.1.4 - Deep learning (reflection, focused thoughts, discussions, revision) 2.1.5 – Access to content				
2.2 Motivation				
2.3 Administration				
2.4 Timesaving				
2.5 Gain experience by using				

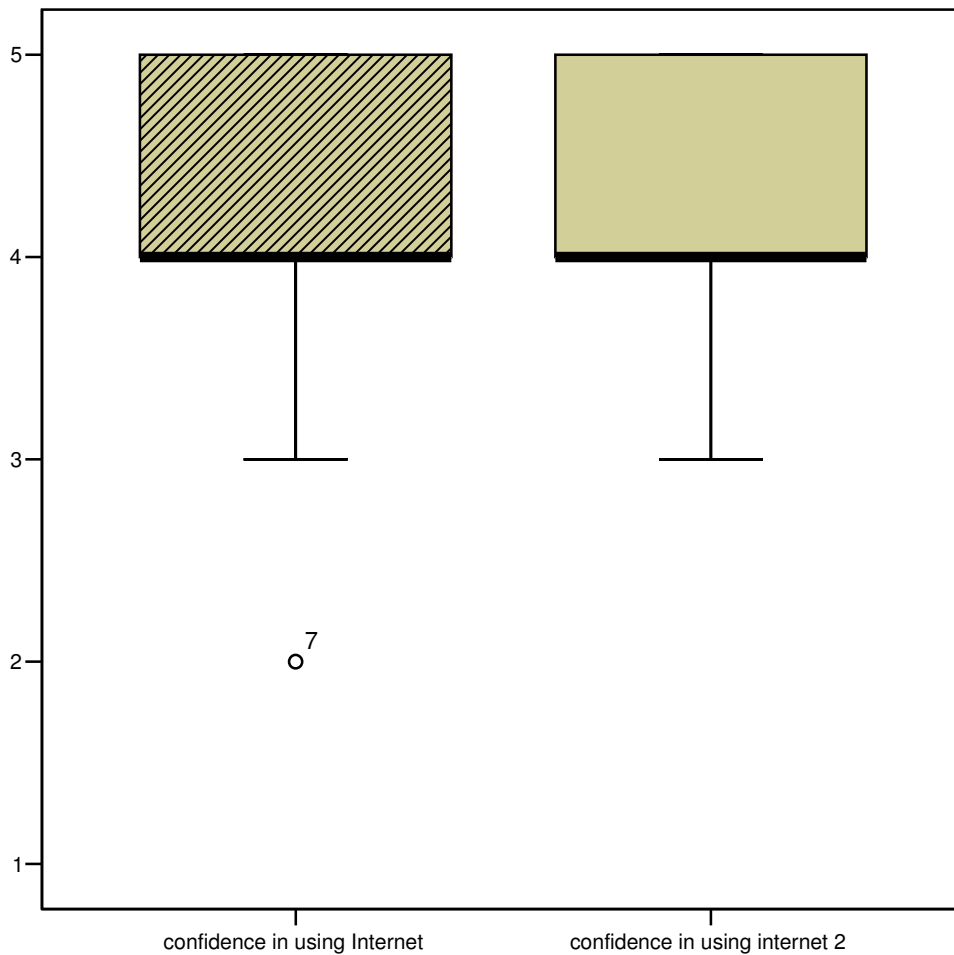
	Postgraduate Students	Undergraduate Students	Postgraduate Staff	Undergraduate Staff
3. Disadvantages of WebCT				
3.1 Learning and teaching non-communication (lurking, not participating) 3.1.2 - access to material 3.1.3 - lack of interactivity and diagrams 3.1.4 – anonymity				
3.2 Administration				
3.3 Time - overloading students				
3.4 Students perceive WebCT as being technology				
4. Role of IT in Learning and Teaching				
5. Future Developments				
5.1- interactivity (eg. quizzes, moving images) 5.2- communication (early task setting) 5.3 – assessment 5.4 – dedicated time 5.5- content 5.6- expectations 5.7- no ideas about developments 5.8- more co-ordination with other modules 5.9 – Improved access				

	Postgraduate Students	Undergraduate Students	Postgraduate Staff	Undergraduate Staff
6. Technical				
6.1 Access 6.1.1 –Physically getting into WebCT (security,logons,firewalls) 6.1.2 – Physically accessing a PC 6.1.3 – Access to PCs that are reliable 6.1.4 – Knowing how to access WebCT				
6.2 Support - for technical issues (accessing form assignments on line)				
7. Training				
7.1 – F2F/hands on session for students 7.2 - training for staff 7.3 – documentation 7.4 – on-going requirement 7.5 – information literacy skills (N.B. – remember that there are future developments in here)				

APPENDIX 12: BOX AND WHISKER PLOTS FROM QUESTIONNAIRES

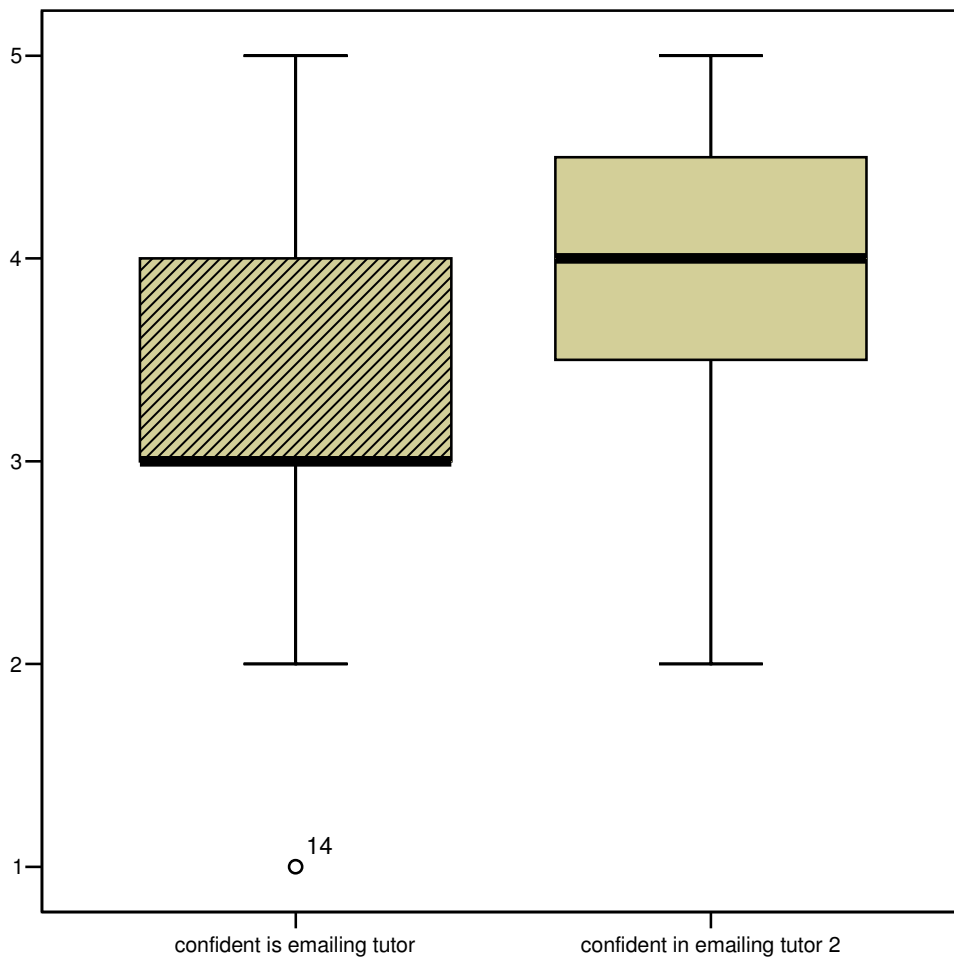
UNDERGRADUATE QUESTIONNAIRES
 VARIABLE 1: STUDENT CONFIDENCE IN USING THE INTERNET

	Valid		Cases Missing		Total	
	N	Percent	N	Percent	N	Percent
confidence in using Internet	20	90.9%	2	9.1%	22	100.0%
confidence in using internet 2	20	90.9%	2	9.1%	22	100.0%



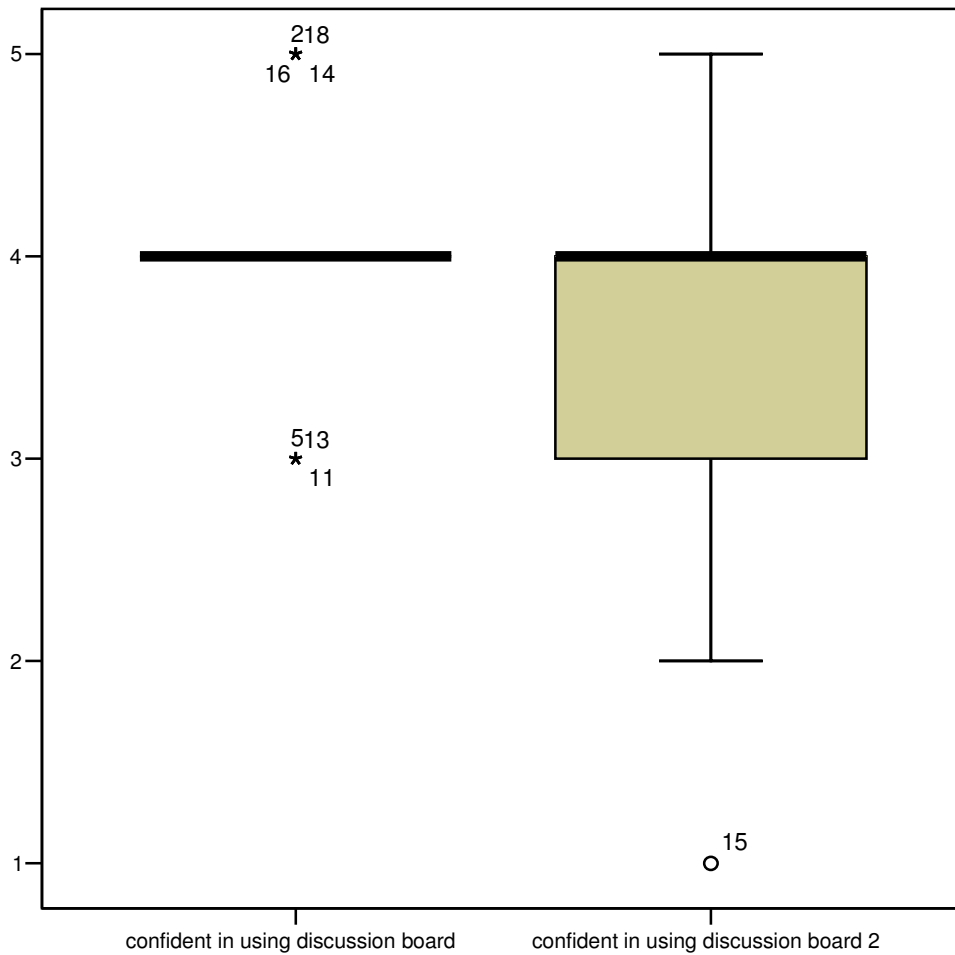
UNDERGRADUATE QUESTIONNAIRES
 VARIABLE 2: STUDENT CONFIDENCE IN COMMUNICATING WITH LECTURER VIA EMAIL

	Valid		Cases Missing		Total	
	N	Percent	N	Percent	N	Percent
confident is emailing tutor	20	90.9%	2	9.1%	22	100.0%
confident in emailing tutor 2	20	90.9%	2	9.1%	22	100.0%



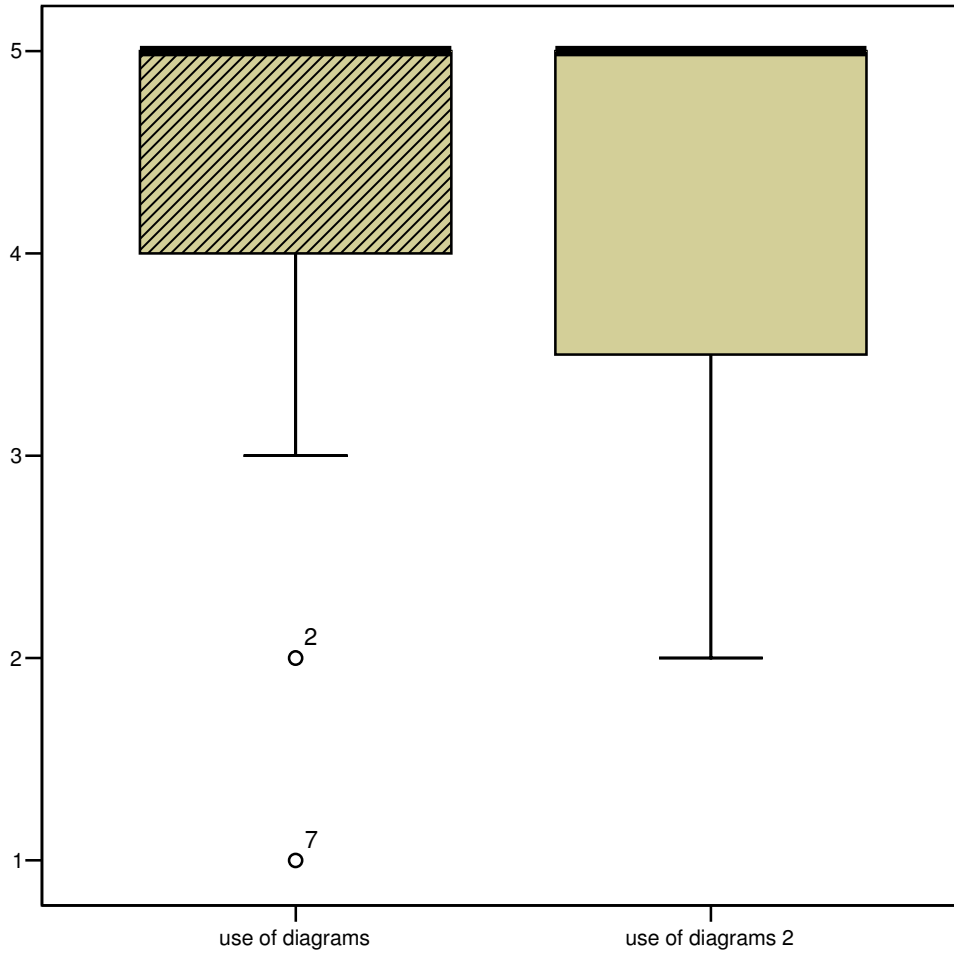
UNDERGRADUATE QUESTIONNAIRES
 VARIABLE 3: VARIABLE 3: LACK OF STUDENT CONFIDENCE IN USING ONLINE
 DISCUSSIONS WHICH READ BY PEERS

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
confident in using discussion board	20	90.9%	2	9.1%	22	100.0%
confident in using discussion board 2	20	90.9%	2	9.1%	22	100.0%



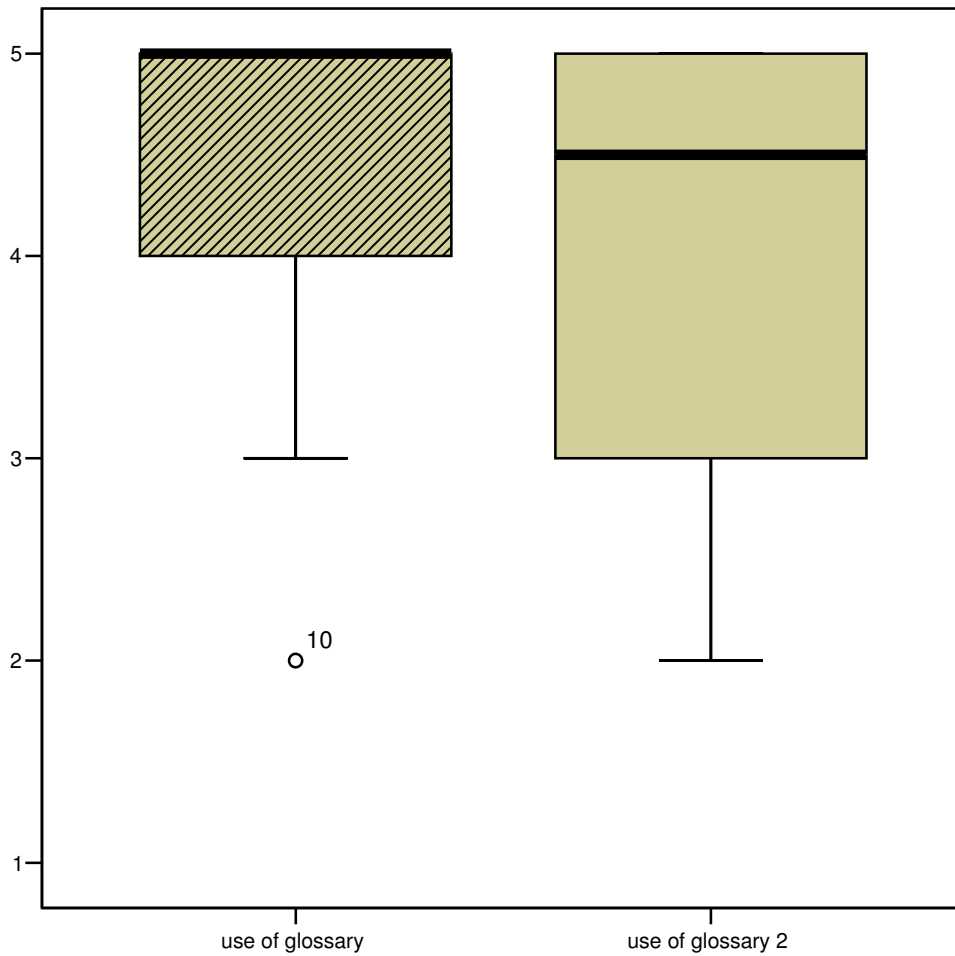
UNDERGRADUATE QUESTIONNAIRES
 VARIABLE 4: USE ON A REGULAR BASIS IF PUBLISHED ON THE WEB: DIAGRAMS

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
use of diagrams	20	90.9%	2	9.1%	22	100.0%
use of diagrams 2	20	90.9%	2	9.1%	22	100.0%



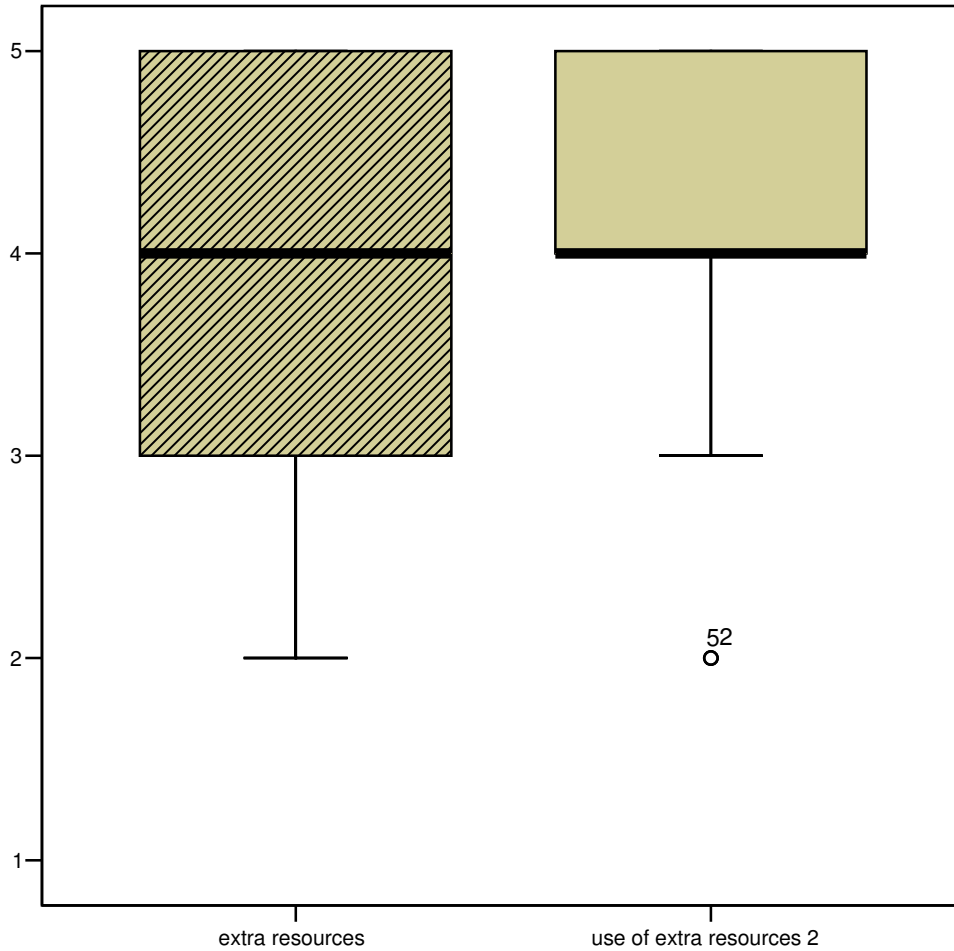
UNDERGRADUATE QUESTIONNAIRES
 VARIABLE 5: USE ON A REGULAR BASIS IF PUBLISHED ON THE WEB: GLOSSARY

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
use of glossary	20	90.9%	2	9.1%	22	100.0%
use of glossary 2	20	90.9%	2	9.1%	22	100.0%



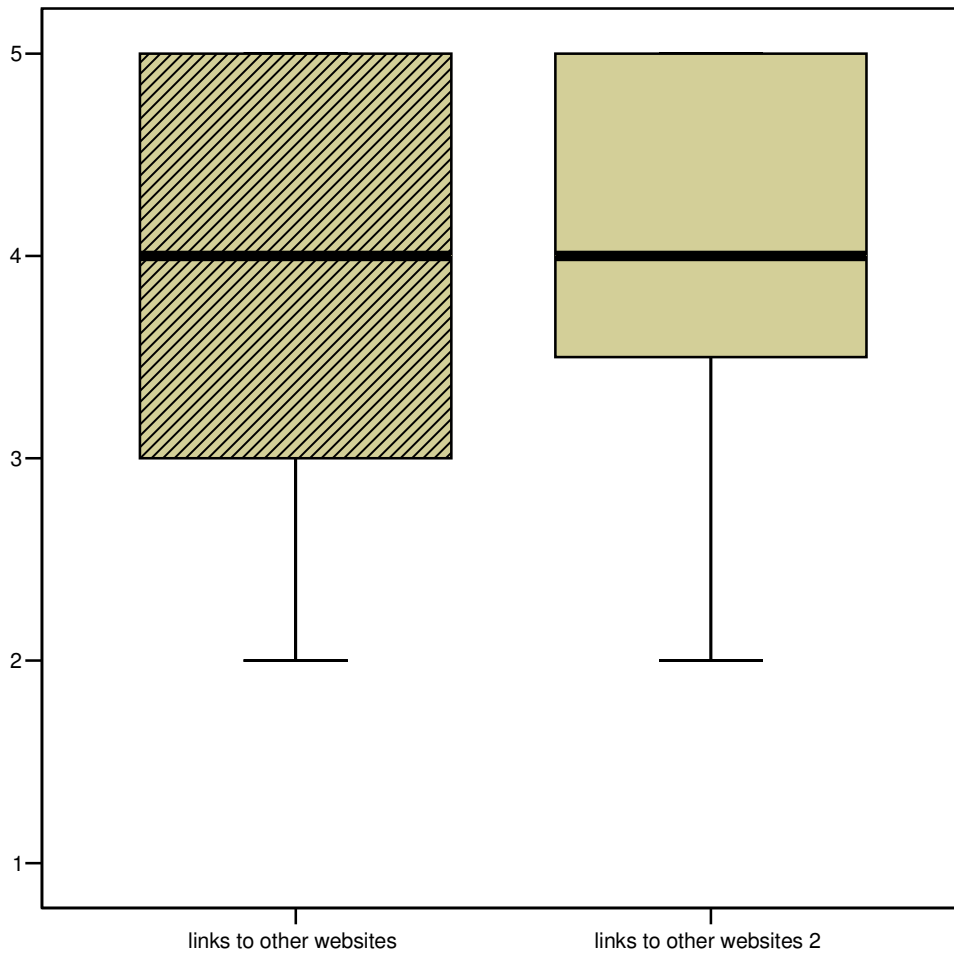
UNDERGRADUATE QUESTIONNAIRES
 VARIABLE 6: USE ON A REGULAR BASIS IF PUBLISHED ON THE WEB: EXTRA
 RESOURCES

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
extra resources	20	90.9%	2	9.1%	22	100.0%
use of extra resources 2	20	90.9%	2	9.1%	22	100.0%



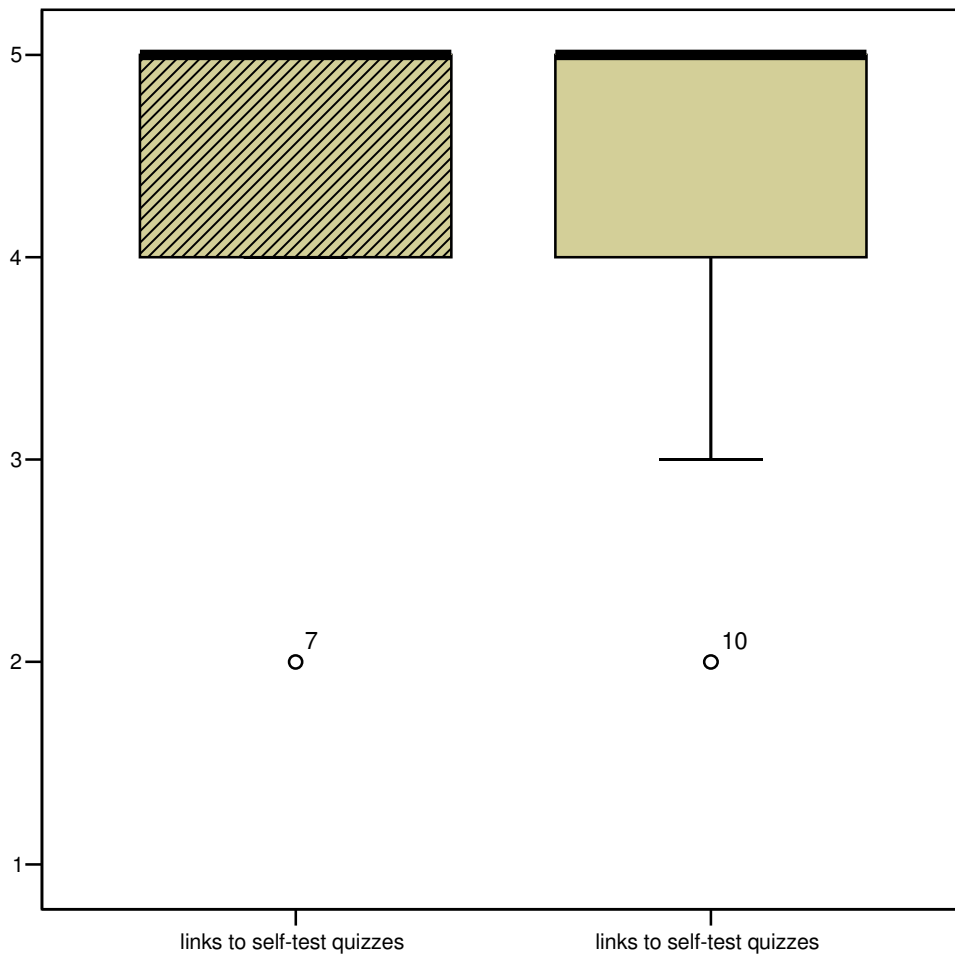
UNDERGRADUATE QUESTIONNAIRES
 VARIABLE 7: USE ON A REGULAR BASIS IF PUBLISHED ON THE WEB: LINKS TO
 OTHER WEBSITES

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
links to other websites	20	90.9%	2	9.1%	22	100.0%
links to other websites 2	20	90.9%	2	9.1%	22	100.0%



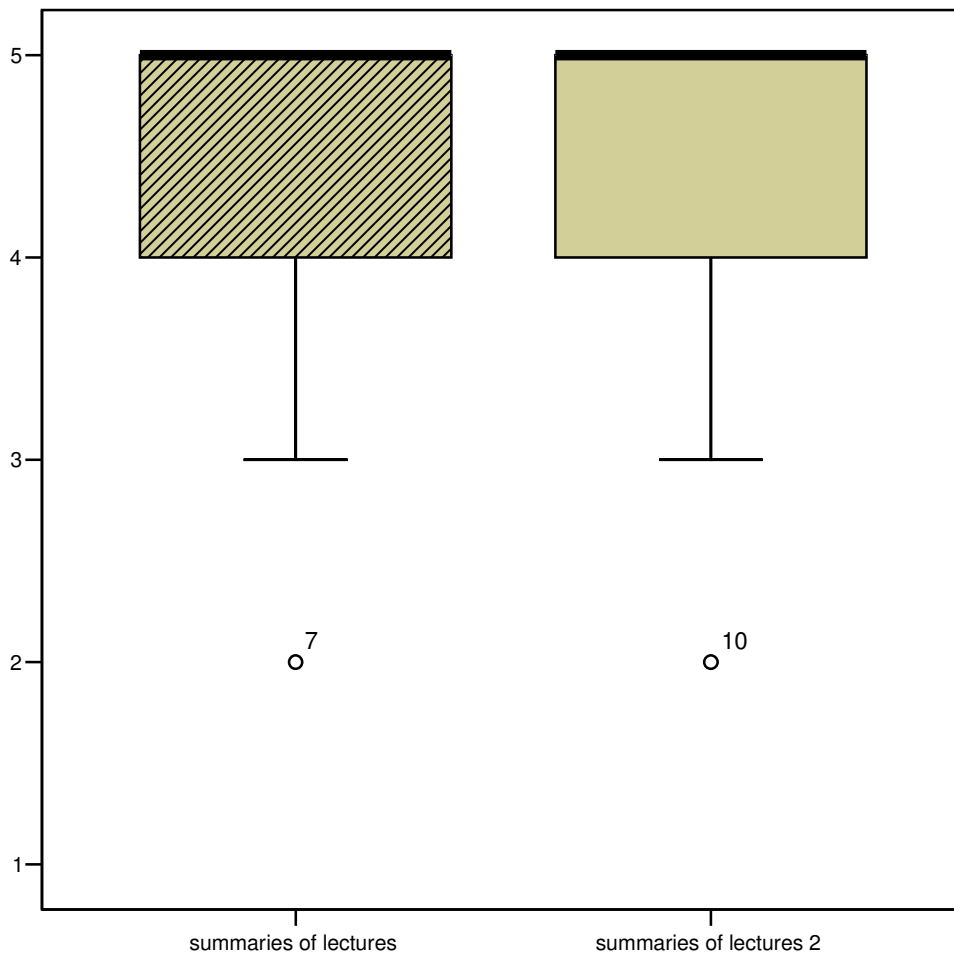
UNDERGRADUATE QUESTIONNAIRES
 VARIABLE 8: USE ON A REGULAR BASIS IF PUBLISHED ON THE WEB: SELF-TEST
 QUIZZES

	Valid		Cases Missing		Total	
	N	Percent	N	Percent	N	Percent
	links to self-test quizzes	20	90.9%	2	9.1%	22
links to self-test quizzes 2	20	90.9%	2	9.1%	22	100.0%



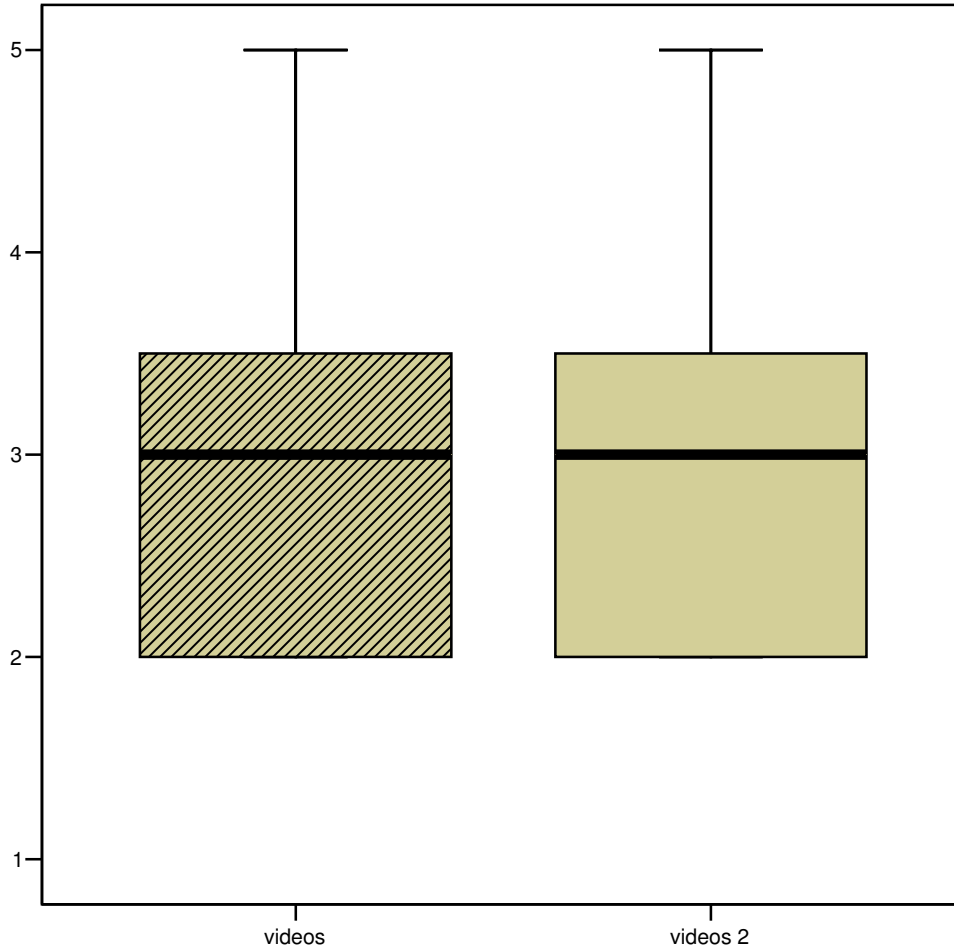
UNDERGRADUATE QUESTIONNAIRES
 VARIABLE 9: USE ON A REGULAR BASIS IF PUBLISHED ON THE WEB: SUMMARIES
 OF LECTURES

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
summaries of lectures	20	90.9%	2	9.1%	22	100.0%
summaries of lectures 2	20	90.9%	2	9.1%	22	100.0%



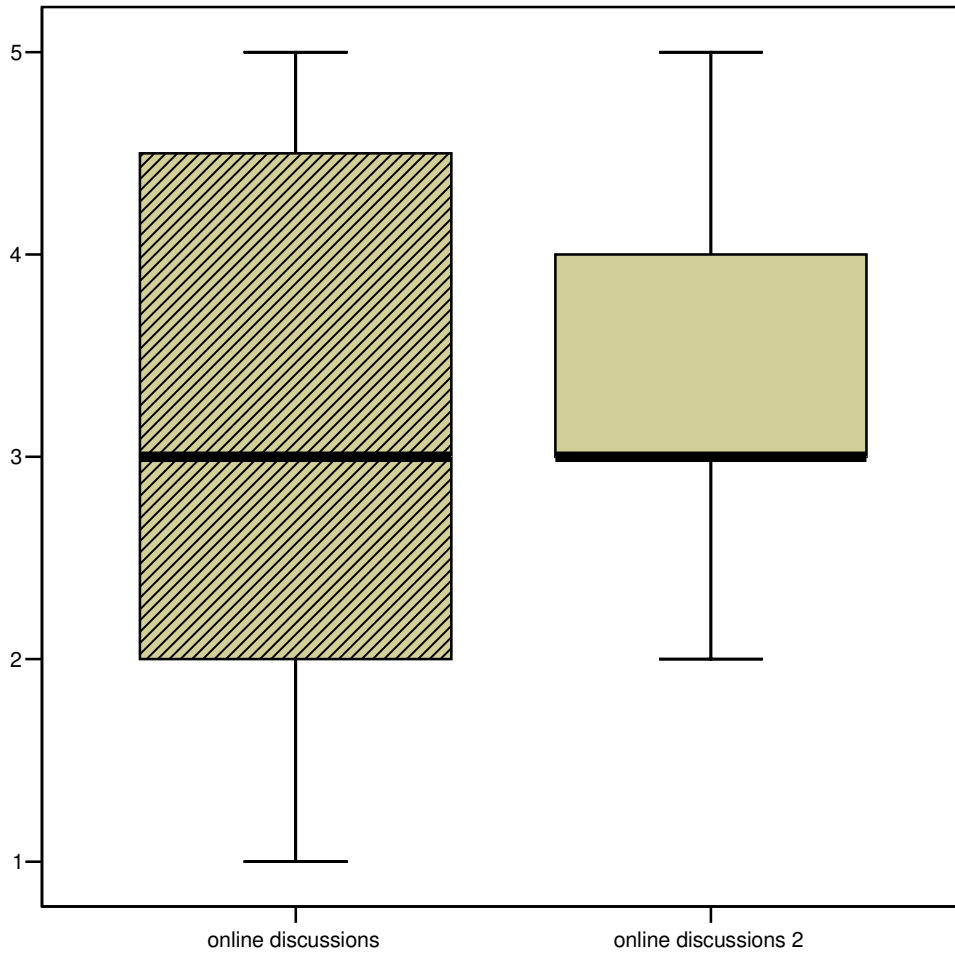
UNDERGRADUATE QUESTIONNAIRES
 VARIABLE 10: USE ON A REGULAR BASIS IF PUBLISHED ON THE WEB: VIDEOS

	Valid		Cases Missing		Total	
	N	Percent	N	Percent	N	Percent
	videos	20	90.9%	2	9.1%	22
videos 2	20	90.9%	2	9.1%	22	100.0%



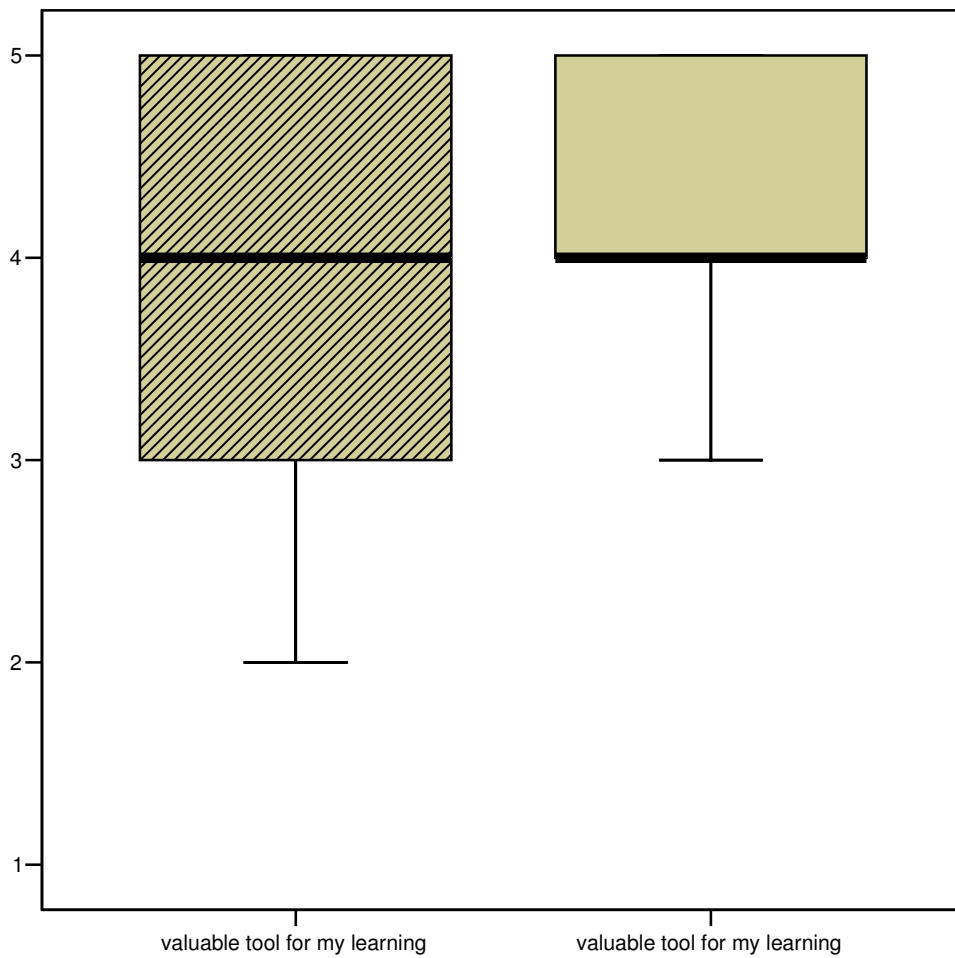
UNDERGRADUATE QUESTIONNAIRES
 VARIABLE 11: USE ON A REGULAR BASIS IF PUBLISHED ON THE WEB: ONLINE DISCUSSIONS

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
online discussions	19	86.4%	3	13.6%	22	100.0%
online discussions 2	19	86.4%	3	13.6%	22	100.0%



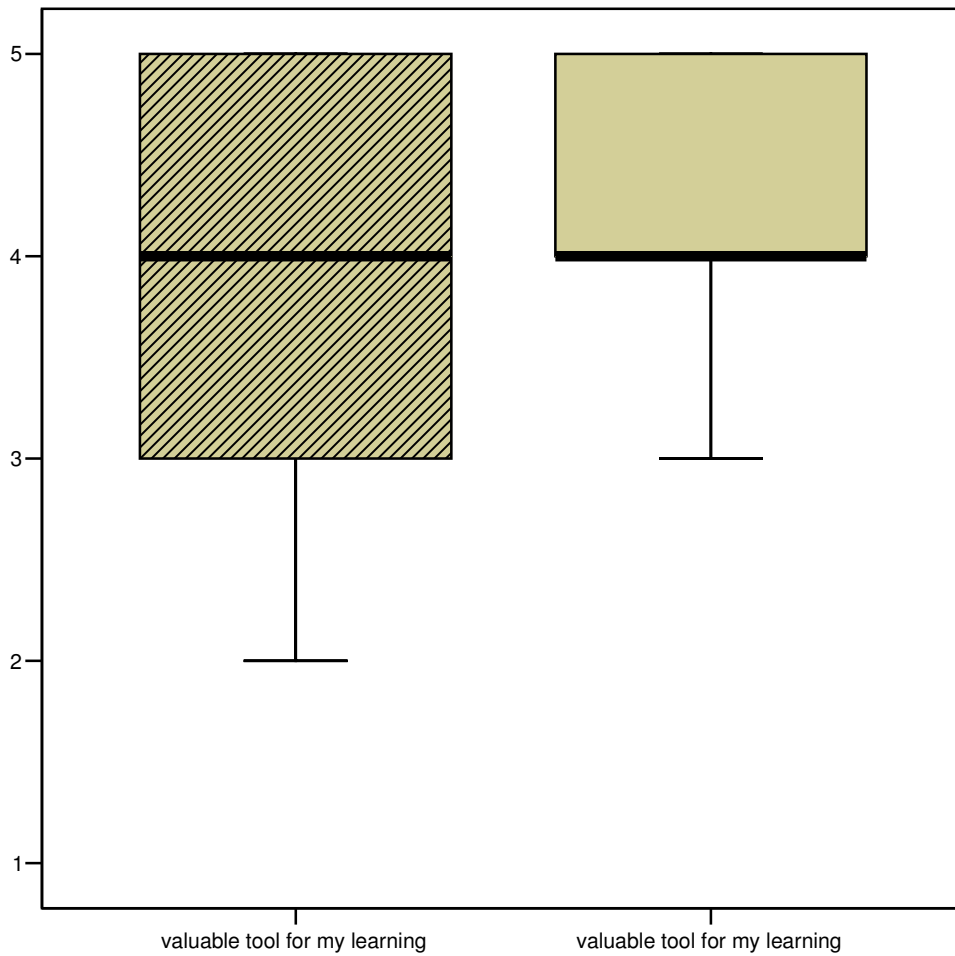
UNDERGRADUATE QUESTIONNAIRES
 VARIABLE 12: ATTITUDE TOWARDS THE INTERNET AS A VALUABLE TOOL FOR
 LEARNING

	Valid		Cases Missing		Total	
	N	Percent	N	Percent	N	Percent
valuable tool for my learning	19	86.4%	3	13.6%	22	100.0%
valuable tool for my learning 2	19	86.4%	3	13.6%	22	100.0%



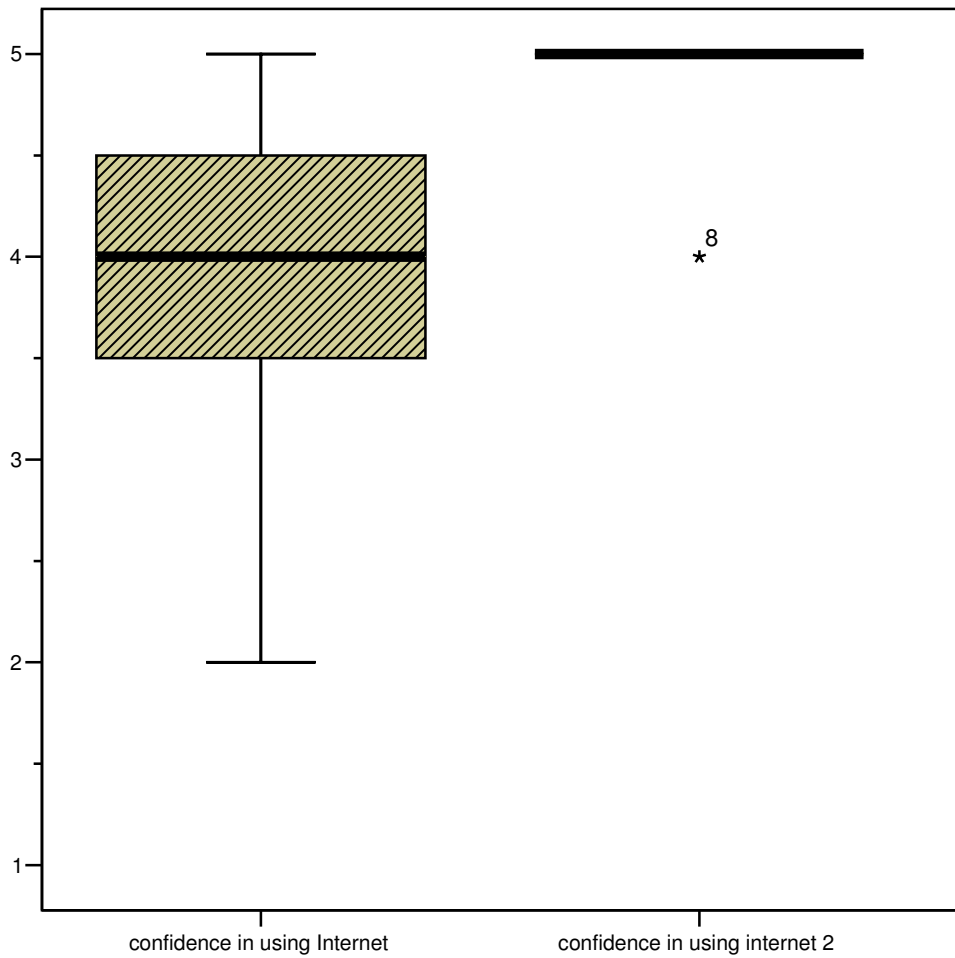
UNDERGRADUATE QUESTIONNAIRES
 VARIABLE 13: ATTITUDE TOWARDS MORE TECHNOLOGIES IN LEARNING

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
valuable tool for my learning	19	86.4%	3	13.6%	22	100.0%
valuable tool for my learning 2	19	86.4%	3	13.6%	22	100.0%



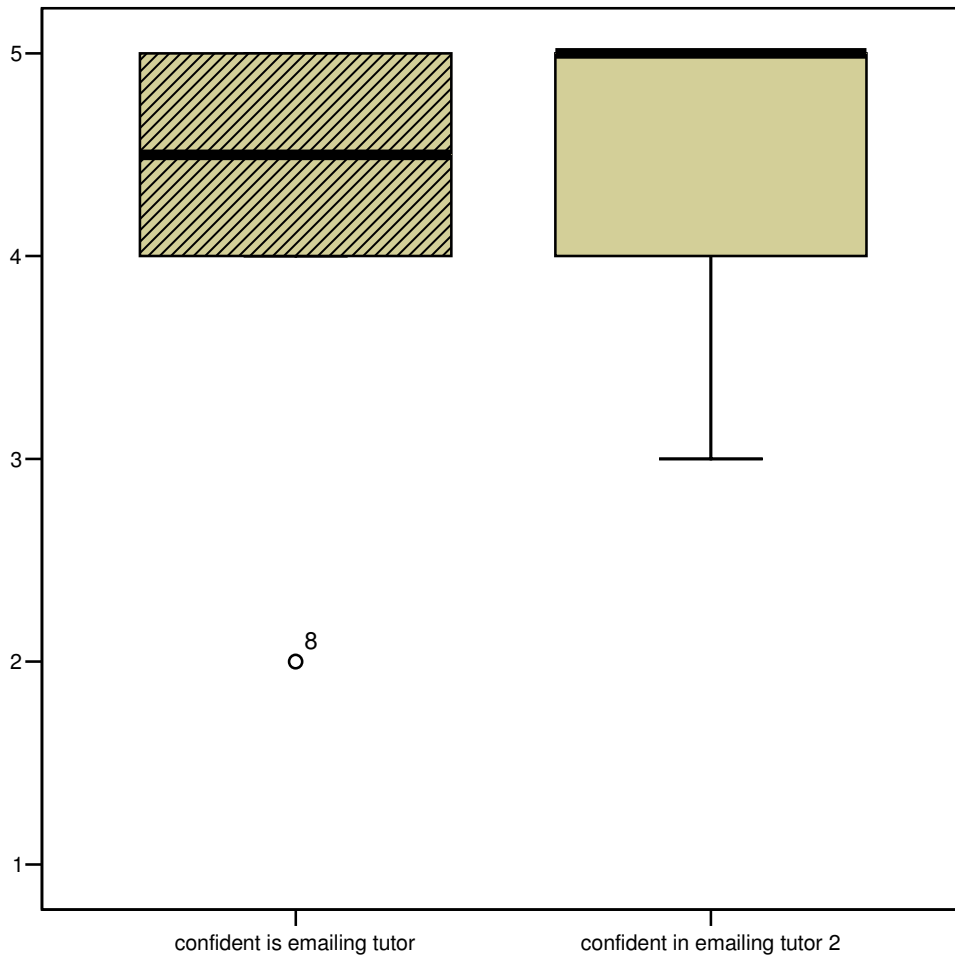
POSTGRADUATE QUESTIONNAIRES
 VARIABLE 1: STUDENT CONFIDENCE IN USING THE INTERNET

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
confidence in using Internet	8	100.0%	0	.0%	8	100.0%
confidence in using internet 2	8	100.0%	0	.0%	8	100.0%



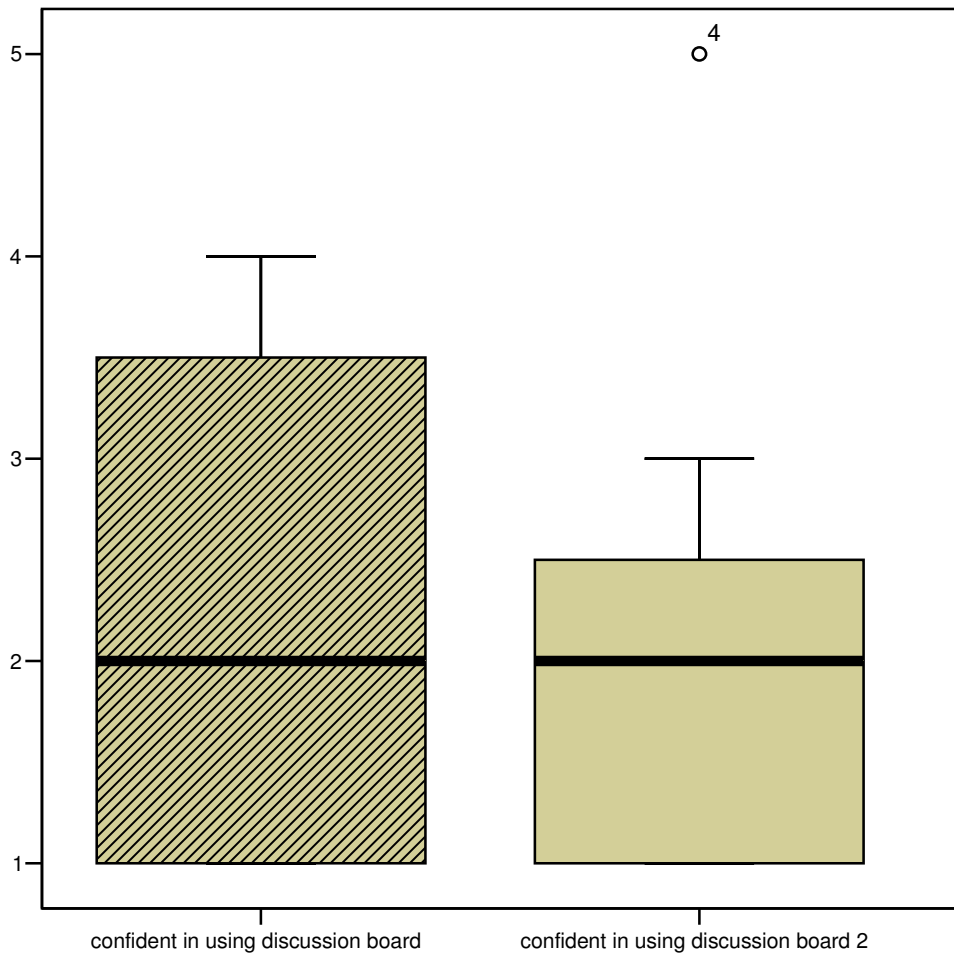
POSTGRADUATE QUESTIONNAIRES
 VARIABLE 2: STUDENT CONFIDENCE IN COMMUNICATING WITH LECTURER VIA
 EMAIL

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
confident in emailing tutor	8	100.0%	0	.0%	8	100.0%
confident in emailing tutor 2	8	100.0%	0	.0%	8	100.0%



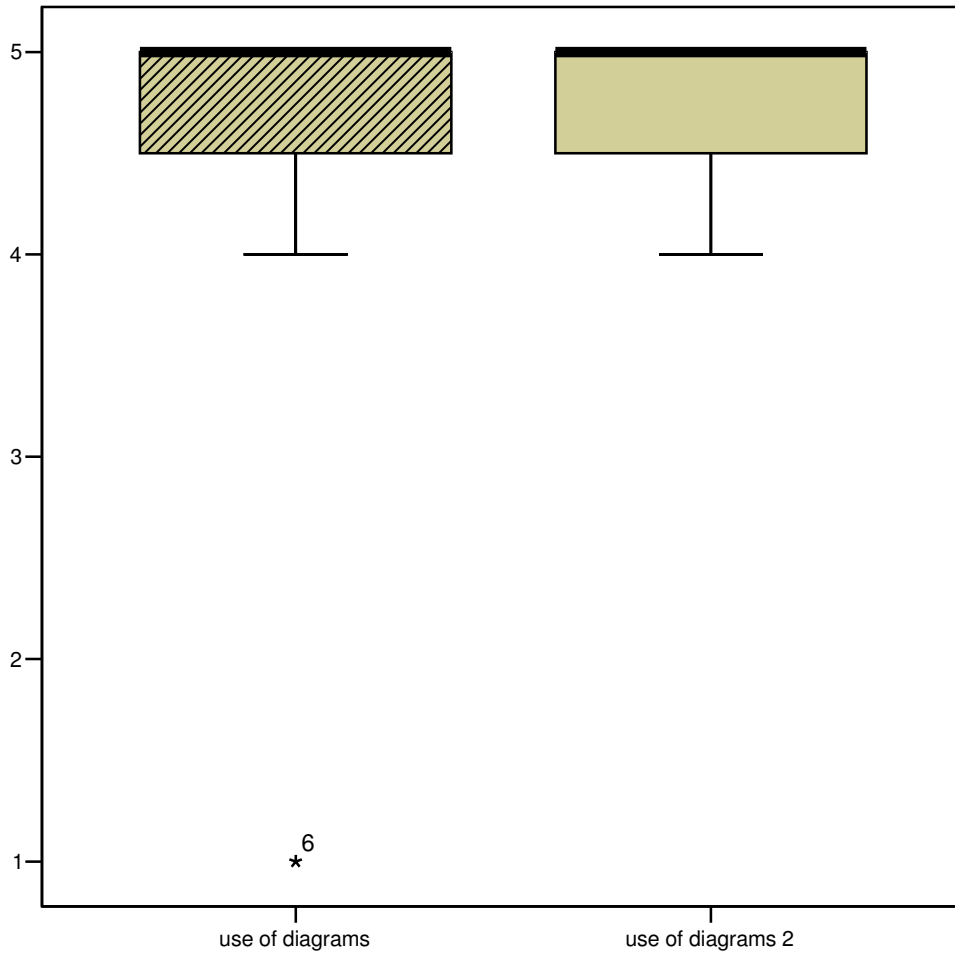
POSTGRADUATE QUESTIONNAIRES
 VARIABLE 3: LACK OF STUDENT CONFIDENCE IN USING ONLINE DISCUSSIONS
 WHICH READ BY PEERS

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Lack of confidence in using discussion board	8	100.0%	0	.0%	8	100.0%
Lack of confidence in using discussion board 2	8	100.0%	0	.0%	8	100.0%



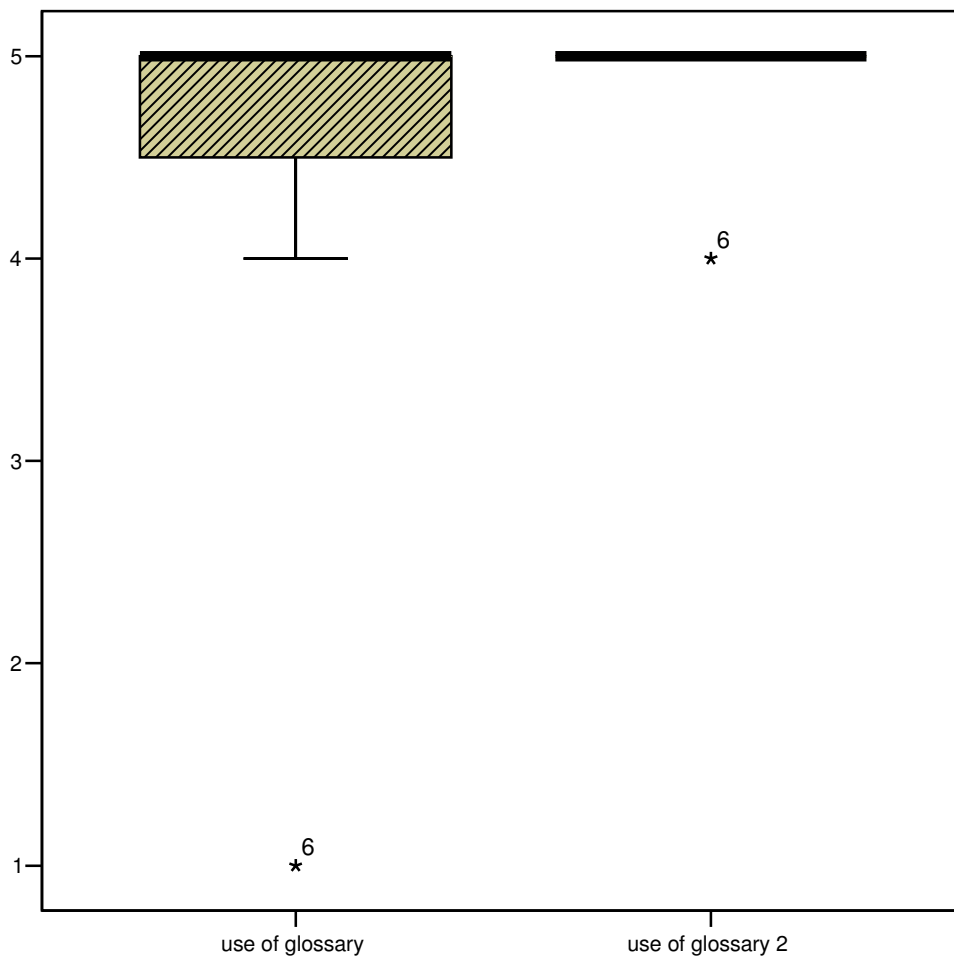
POSTGRADUATE QUESTIONNAIRES
 VARIABLE 4: USE ON A REGULAR BASIS IF PUBLISHED ON THE WEB: DIAGRAMS

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
use of diagrams	7	87.5%	1	12.5%	8	100.0%
use of diagrams 2	7	87.5%	1	12.5%	8	100.0%



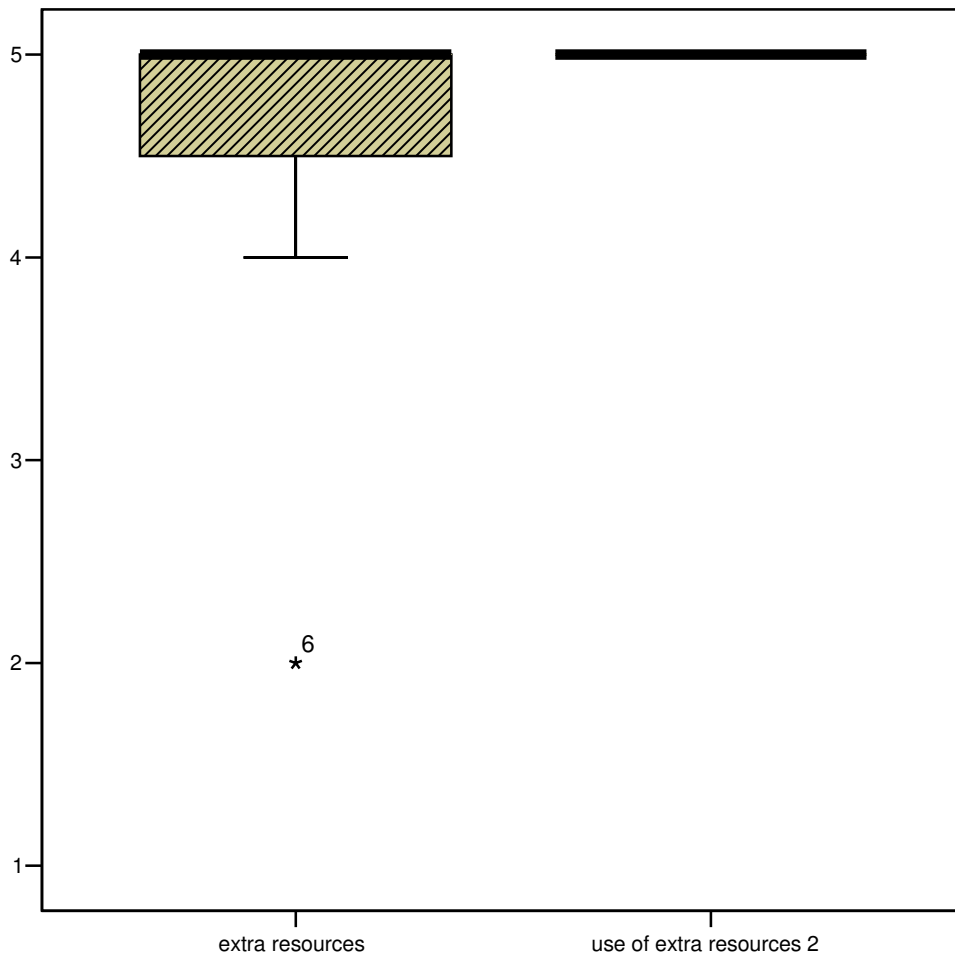
POSTGRADUATE QUESTIONNAIRES
 VARIABLE 5: USE ON A REGULAR BASIS IF PUBLISHED ON THE WEB: GLOSSARY

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
use of glossary	7	87.5%	1	12.5%	8	100.0%
use of glossary 2	7	87.5%	1	12.5%	8	100.0%



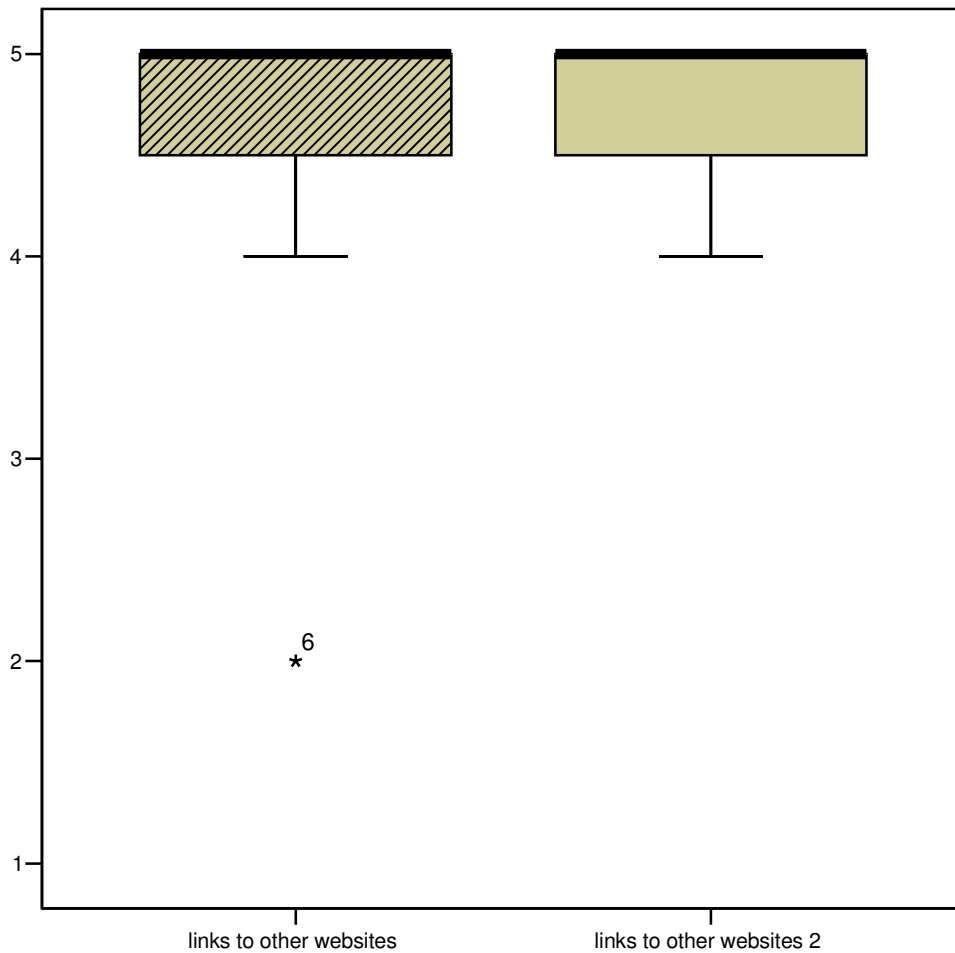
POSTGRADUATE QUESTIONNAIRES
 VARIABLE 6: USE ON A REGULAR BASIS IF PUBLISHED ON THE WEB: EXTRA
 RESOURCES

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
extra resources	7	87.5%	1	12.5%	8	100.0%
use of extra resources 2	7	87.5%	1	12.5%	8	100.0%



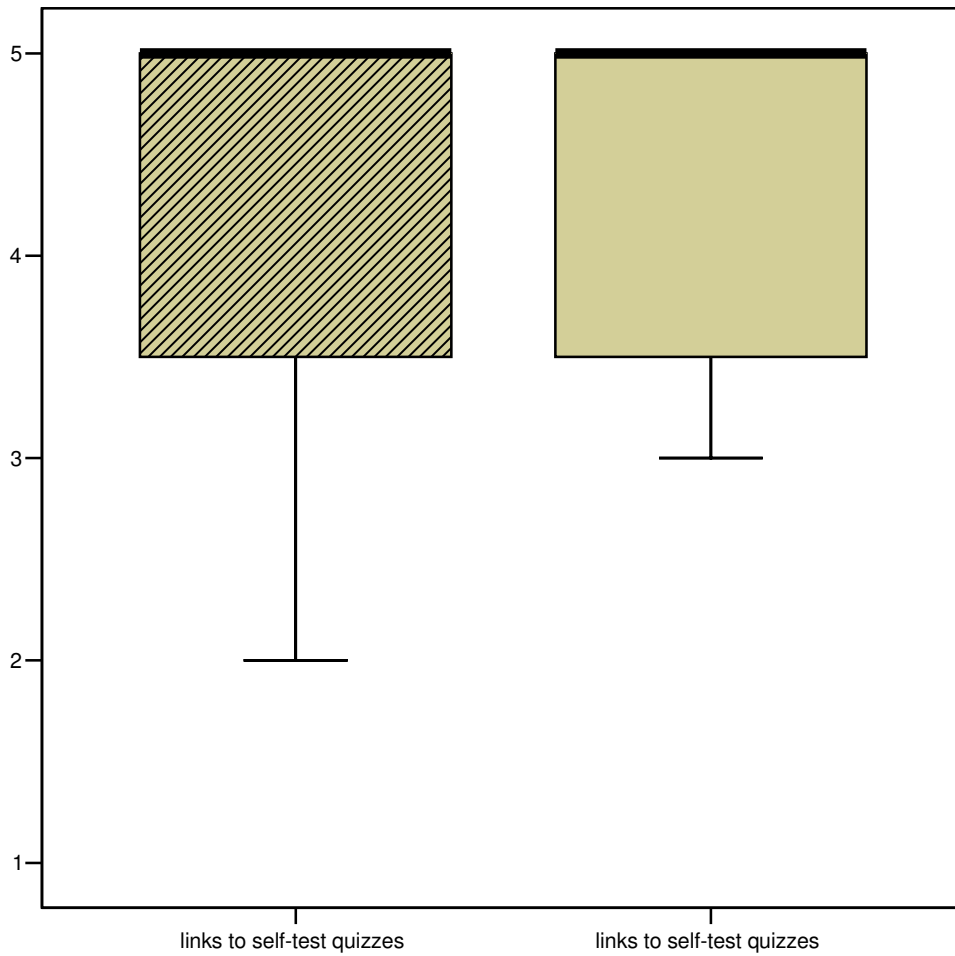
POSTGRADUATE QUESTIONNAIRES
 VARIABLE 7: USE ON A REGULAR BASIS IF PUBLISHED ON THE WEB: LINKS TO
 OTHER WEBSITES

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
links to other websites	7	87.5%	1	12.5%	8	100.0%
links to other websites 2	7	87.5%	1	12.5%	8	100.0%



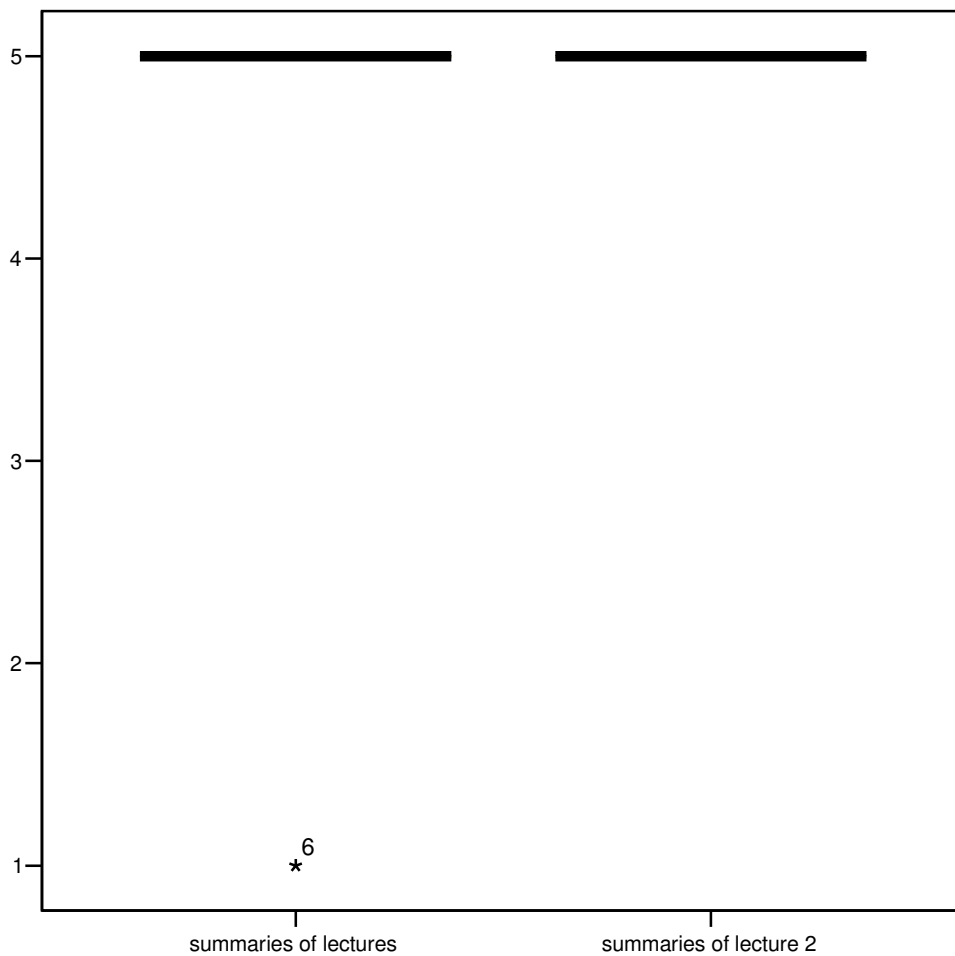
POSTGRADUATE QUESTIONNAIRES
 VARIABLE 8: USE ON A REGULAR BASIS IF PUBLISHED ON THE WEB: SELF-TEST
 QUIZZES

	Valid		Cases Missing		Total	
	N	Percent	N	Percent	N	Percent
	links to self-test quizzes	7	87.5%	1	12.5%	8
links to self-test quizzes 2	7	87.5%	1	12.5%	8	100.0%



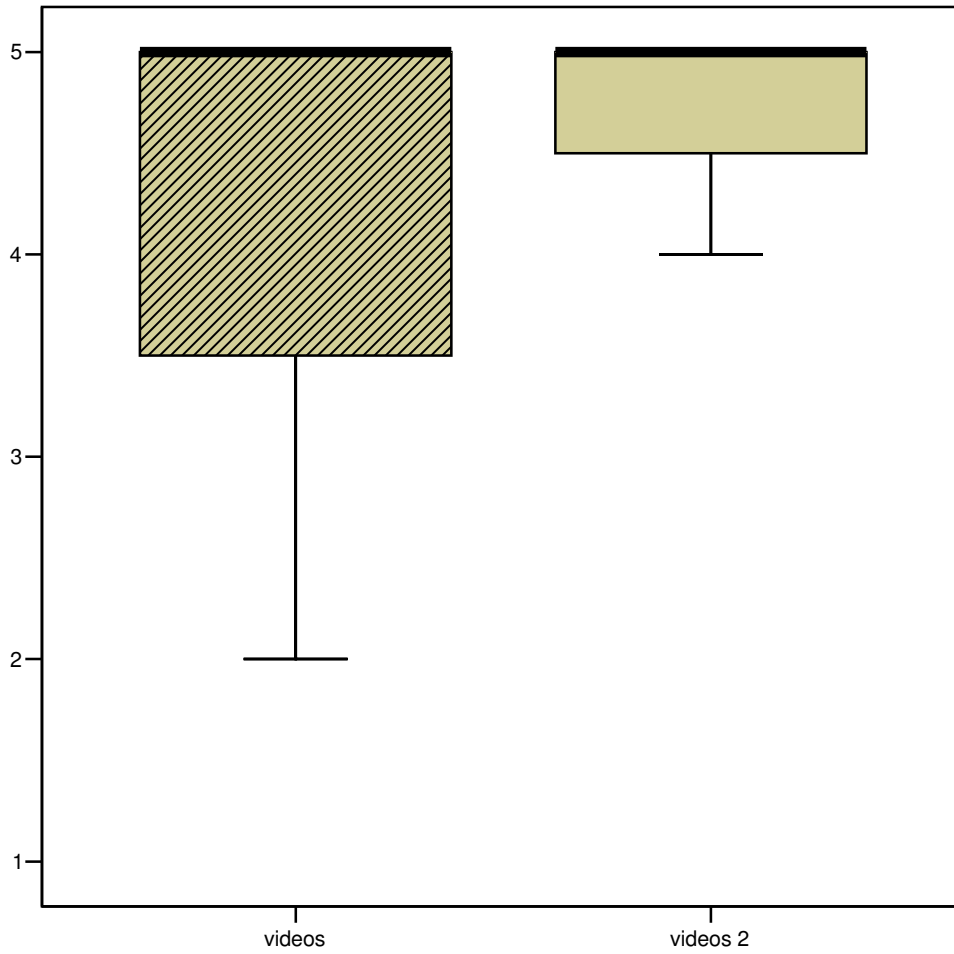
POSTGRADUATE QUESTIONNAIRES
 VARIABLE 9: USE ON A REGULAR BASIS IF PUBLISHED ON THE WEB: SUMMARIES
 OF LECTURES

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
summaries of lectures	7	87.5%	1	12.5%	8	100.0%
summaries of lecture 2	7	87.5%	1	12.5%	8	100.0%



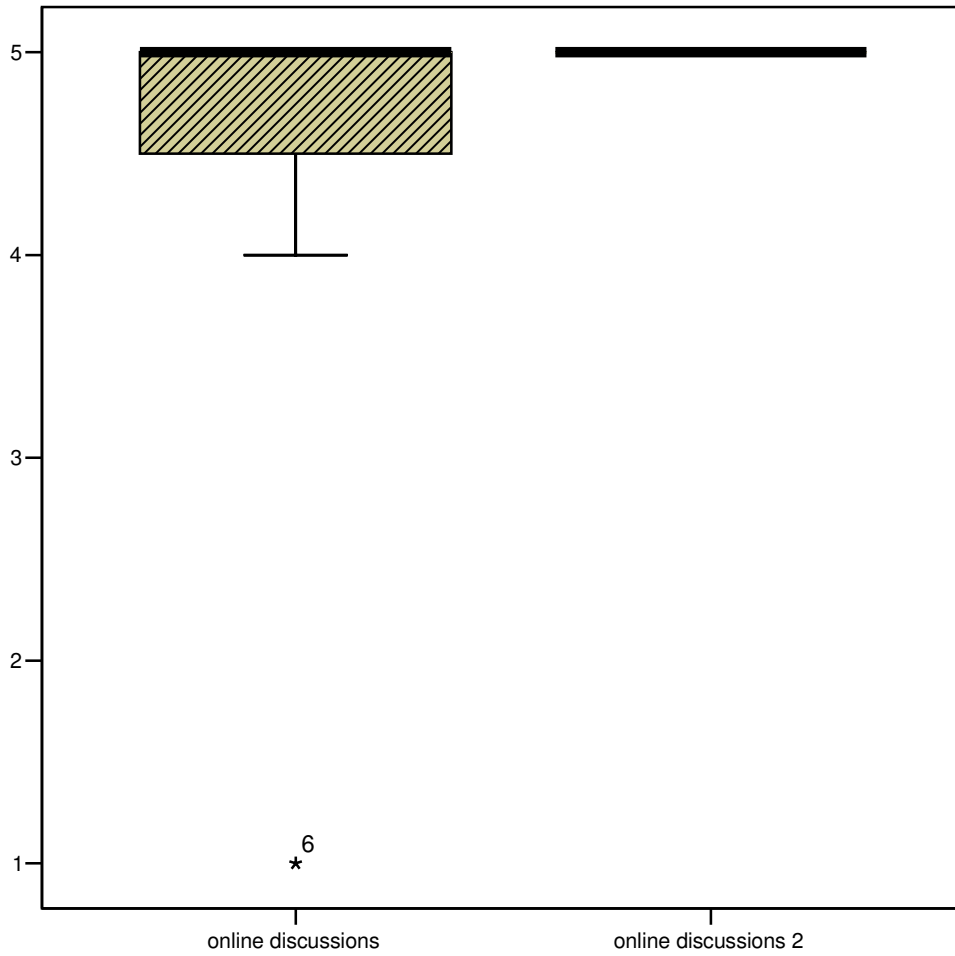
POSTGRADUATE QUESTIONNAIRES
 VARIABLE 10: USE ON A REGULAR BASIS IF PUBLISHED ON THE WEB: VIDEOS

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
videos	7	87.5%	1	12.5%	8	100.0%
videos 2	7	87.5%	1	12.5%	8	100.0%



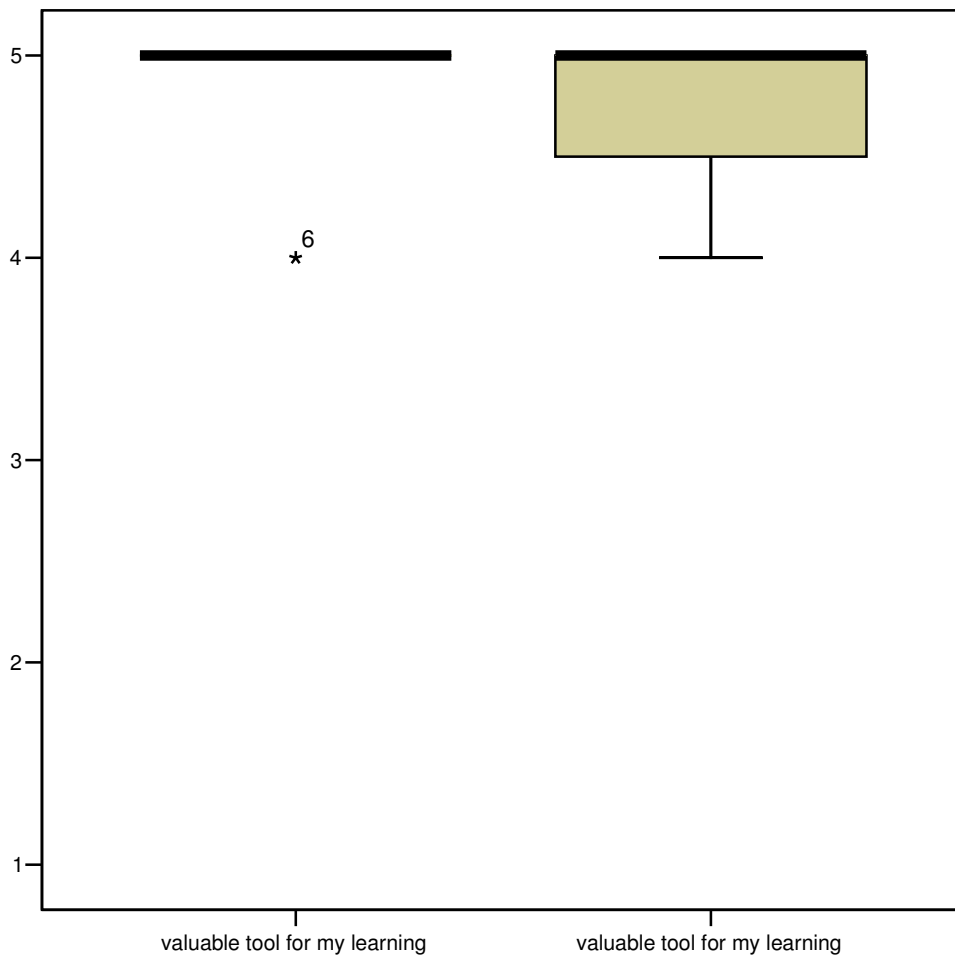
POSTGRADUATE QUESTIONNAIRES
 VARIABLE 11: USE ON A REGULAR BASIS IF PUBLISHED ON THE WEB: ONLINE DISCUSSIONS

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
online discussions	7	87.5%	1	12.5%	8	100.0%
online discussions 2	7	87.5%	1	12.5%	8	100.0%



POSTGRADUATE QUESTIONNAIRES
 VARIABLE 12: ATTITUDE TOWARDS THE INTERNET AS A VALUABLE TOOL FOR
 LEARNING

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
valuable tool for my learning	7	87.5%	1	12.5%	8	100.0%
valuable tool for my learning 2	7	87.5%	1	12.5%	8	100.0%



POSTGRADUATE QUESTIONNAIRES
 VARIABLE 13: ATTITUDE TOWARDS MORE TECHNOLOGIES IN LEARNING

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
not use more technologies	7	87.5%	1	12.5%	8	100.0%
more technologies 2	7	87.5%	1	12.5%	8	100.0%

