THE USE OF THE WORLD WIDE WEB IN TEACHING AND LEARNING IN HIGHER EDUCATION: A CASE STUDY APPROACH

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8. Themes

In this chapter the main themes from the results in chapters 6 and 7 are summarised. Broadly, the first section presents the views of the case study lecturers, i.e., the aims of the website and the innovators motivations for using the web. The second concentrates on the students' perspective, exploring issues such as the basic characteristics of the student cohorts, their Internet access and use, and the fit between students' use and the intended use of the case study site as defined by the lecturers. The third part considers the relationships between the use of the web and staff / student relationships and the fourth explores institutional factors that are relevant when considering the adoption of the WWW in teaching and learning in the university. The concluding section will summarise the main points, and highlight areas that will be discussed in detail in chapter 9. For simplicity cases are numbered in the same order as discussed in chapters 6 and 7.

8.1 Motivations of the case study lecturers to use the WWW in teaching and learning

In this section the motivations of the case study lecturers are explored, primarily through summarising the findings of interviews with the innovators, and to a lesser extent the findings from analysis of course documents and the websites of interest. The first part explores lecturers' motivations to enhance the educational experiences of the students and the second other, more personal, incentives.

8.1.1 Educational motivations

In all six cases the WWW was primarily used with the intention of improving the educational experience for students. Each case encompassed a combination of supplementary resources and / or a discussion board, yet the motivations for creating and the intended purpose of the websites varied.

In case 1 (Law), a principal reason for the lecturer to use the web was to increase student interest in the subject and enhance motivation. Thus, he created a website that contained a wide range of resources in order that students could easily and quickly access a range of materials. He hoped this would lead to the students looking at a greater number and variety of sources than they had in pervious years. The use of a discussion board was designed to promote interest through providing students with

the opportunity to discuss one another's experiences of the courts they had each visited over the summer. In case 2 (Dentistry) the website was designed as a "filing cabinet", i.e., a place students could access up-to-date information and resources relevant to the module. The aim was to ensure all students had consistency of information despite potential different experiences while on clinical placement and, in some cases, provided an opportunity to learn about topics they had not yet covered / missed in class that they encountered in practice. The site also contained a bulletin board, which was used mainly for announcements. In case 3 (English), the website was developed to organize and structure the module for the students and to provide access to module resources. The website was the only place the students could access all the information they required to prepare for seminars and helped to overcome the lack of available materials in the university library. A discussion board on the website provided students with a forum to continue the debates begun in the seminars. Finally, students were encouraged to contact the lecturer via email to discuss issues and ask questions.

Thus in each case at Old U, the provision of a comprehensive set of resources, including a discussion / bulletin board had different central purposes. In case 1 (Law) it was to enhance interest and increase motivation through convenient access to resources and the opportunity to share and discuss experiences, in case 2 (Dentistry), to ensure consistency and availability of information / resources, and, in case 3 (English), to provide an organisational function, save students time (similar to case 1), to overcome a lack of university resources and to provide a forum for further discussion.

Case 4 (Midwifery) at New U focused on the use of a series of discussion boards, with supplementary materials placed on the boards by tutors, midwives or students when appropriate. The aims of the initiative were to provide: a means for students to link theory with clinical practice; support to students whilst on clinical placement; a consistency of information and learning experience regardless of location of clinical placement; and opportunities to promote independent and collaborative learning skills. In case 5 (German), while supplementary resources, such as module information and external links, were available, the central purpose of the website was the use of the discussion board. The facility was primarily used to overcome reduced contact hours and provide a means for students to improve their German writing and

other communicative skills. In case 6 (Cultural Studies), the supplementary resources were intended to be used in a number of ways: to provide resources of interest, to provide an organisation function by giving the students the course in week-by-week sections, to encourage preparation for the following week and to motivate students to read more of the key text through the use of online MCQs. The compulsory use of the discussion board was intended to assist students in discussing topics they may find difficult to talk about in face-to-face situations, for example, sexuality or race, and lead to students being more tolerant and aware of other cultures and differences within cultures, and to a lesser extent, improve communication skills.

Thus at New U, the use of web-based resources tended to be less of a focus, with a greater stress on the use of on-line discussions compared to the modules at Old U. Similar to Old U, each case had slightly different functions, in case 4 (Midwifery), to link theory and clinical practice, provide support, consistency of information and learning experience, and enhance collaborative learning and lifelong learning skills and in case 5 (German), to overcome a reduction in contact hours and improve written and other communication skills. Finally, in case 6 (Cultural Studies) the web was used as a form of module organisation, to encourage reading, to enhance discussion of difficult topics, to increase understanding and tolerance of other cultures and improve communication skills. There are some similarities between cases at Old U and New U, notably the importance of providing consistency of information in cases 2 (Dentistry) and 4 (Midwifery), where students may encounter different clinical experiences, and to provide a way to organise the module as in cases 3 (English) and 6 (Cultural Studies) where the face to face teaching is seminar based and prior reading / preparation by the students is of particular importance.

In total, four of the case study sites used the web as a voluntary supplement to the existing course, i.e. cases 1 (Law), 2 (Dentistry), 3 (English), and 4 (Midwifery). However, in case 1 (Law), students were expected to make contributions to the discussion board and in case 3 (English) the use of the website was required in order to access relevant materials and information to prepare for seminars. The two remaining cases at New U, 5 (German) and 6 (Cultural Studies), involved assessment of contributions to the discussion board, though the use of the remainder of the website were designed as a supplement to the existing module. In only one case, case

6 (Cultural Studies), was the web used as a partial replacement of some of the face-to-face teaching in the latter half of the semester.

In two of the cases, 3 (English) and 5 (German), the use of the WWW has been used in direct response to problems universities are typically facing, i.e., to overcome a lack of library resources and a reduction in contact hours respectively. In case 3 (English), the use of the web to provide a number of resources had led to greater efficiency for the students, and due to a reduction in queries or need to provide students with paper based copies also saved the lecturer time. However, in case 5 (German), while the use of the discussion boards overcame a reduction in face-to-face contact, this time was merely transferred to on-line teaching and there was no real reduction in staff time. In case 1 (Law) the innovator felt there might be an increased place in the future for the MLE to overcome the likely social implications of teaching students in larger groups (due to rising student numbers) though currently this was not a purpose of the website.

Particularly in cases 1 (Law), 3 (English), and 6 (Cultural Studies), but to some extent all the lecturers endeavoured to encourage a greater amount of independent learning through the provision of web-based resources. In cases 4 (Midwifery) and 6 (Cultural Studies) the web was used to encourage the development of these skills through on-line discussion and, particularly in case 4, tried to promote collaborative learning skills. Indeed, independent and collaborative learning skills are highlighted in policy documents such as the Dearing report and these lecturers have found ways technology may assist them with this goal.

8.1.2 Personal motivations

Aside from the use of the WWW to enhance the educational experience for students the case study lecturers had other motives for using technology in their teaching. These motives were concerned with personal interest and rewards as opposed to incentives from the institution. At Old U, in all three cases a motivating factor was enjoyment and interest in using the technology. In case 2 (Dentistry), the lecturer was also motivated by the desire for the school to have a excellent reputation in this area and in case 3 (English), the lecturer used the WWW to save him time in terms of course organisation and distributing resources / information to the students. Thus, similar to some of the themes found in the policy literature, the lecturers in cases 2

and 3 were using the web partly to enhance reputation and save time. At Old U, all the innovators had been using technology in their teaching for over a decade, and they had initially received no institutional rewards for their work. At the time of the research, cases 1 (Law) and 2 (Dentistry) had received some school level and/or institutional support. While welcomed, these institutional initiatives did not lead to great individual rewards, though they did provide opportunities for work to be done more easily, or roll the initiatives out at a school / departmental level.

At New U, in cases 5 (German) and 6 (Cultural Studies), the primary motivations for the lecturers to use the WWW was a combination of an interest in teaching more innovatively and enjoyment and interest in using technology. In case 4 (Midwifery), the lecturer's principal motive was to use more innovative approaches that moved away from didactic teaching methods and this was the first time she had used technology in her teaching. The lecturers in cases 5 (German) and 6 (Cultural Studies) had previously used the web in teaching and learning. At the time of the research, all three innovators had support from central projects, and the lecturers in cases 5 and 6 also had teaching fellowship awards. The innovator of case 4 had very little support at school level. In contrast, cases 5 and 6 (who were based in the same school) had some support at this level. Further, the innovator in case 5 was employed to spend half her time developing the use of ICTs in teaching and learning within her division. Similar to Old U, despite some form of institutional support, the primary motivations for lecturers to use the web were the benefits for students and individual interest, the institutional support merely helped them achieve their goals. This issue is discussed further in section 8.5.

The next two sections will focus on the student perspective and examine the student cohort, and the student use and opinion of the case study websites.

8.2 The student cohort

The summary findings discussed in this section are based on the students' responses to questionnaire 1.[48] From the results, all of the student cohorts at Old U can be described as "traditional." The vast majority of these students were full time, had

[48] Obviously, self–report is not always reliable, for example, students may be uncomfortable answering specific questions about age and educational background, and may over or under estimate responses to questions such as frequency of Internet access. However, this technique was considered to be the most useful method. See chapter 4.

taken A-levels prior to entering university, and, judging by their age range, many had come straight from school or college. In addition, a small proportion in cases 1 (Law) and 3 (English) were Erasmus students. At New U, the student cohort in case 5 (German) was similarly traditional, while the student cohort in cases 4 (Midwifery) and 6 (Cultural Studies) were more mixed, as, although the majority of students took A-levels prior to university and were full time, there were a greater proportion of students who were older and / or took alternative routes into higher education. Similar to cases 1 (Law) and 3 (English), case 6 (Cultural Studies) had a significant proportion of Erasmus students. Thus, there were slight differences in the basic characteristics of the student cohorts at Old and New U.

In all cases at Old U the majority of students reported regularly accessing the Internet, with over 75% of the students in each case reporting accessing the Internet once a week or more. In cases 1 (Law) and 2 (Dentistry) there were a significant minority (approximately between 10-20%) of students who accessed the Internet once a month or less.[49] At New U, the three students in case 5 (German) reported accessing the web on a daily basis. In case 6 (Cultural Studies) 83% of students reported using the Internet at least once a week with only 2% accessing the Internet on a monthly basis or less. The students in case 4 (Midwifery) are the least frequent users of the Internet, with just under 70% of students reporting using the Internet on a weekly basis or more, with 25% of students using the Internet once a month or less. While direct comparisons are difficult (as in case 3 the students replied by email and case 5 contains a very small group of students) it seems there are few differences between frequency of Internet access between students at Old U and New U, though case 4 (Midwifery) at New U encompassed the highest proportion of students who report infrequent access to the Internet. This may be in part due to the nature of the subject and the more mixed age range and educational background of the students.

At Old U, just over half the students in cases 1 (Law) and 3 (English) reported that they had access to the Internet from their term time address[50] and in case 2 (Dentistry) under half the students had access to the Internet from their term time address. Interestingly, term time access appears to be slightly better at New U, in

[49] Case 3 (English) did not have a similar pattern but this may be because the responses are skewed as the questionnaire was carried out via email.

[50] Although again, it should be noted that in case 3 (English) responses were by email, which may have skewed the sample.

case 4 (Midwifery), just over half had access at their term time address, in case 5 (German), all had term time access[51] and in case 6 (Cultural Studies) almost 70% had access to the Internet from their term time address.

One would assume that the student cohorts at Old U would be more traditional, have better access and be more frequent users of the Internet. However, although the students at Old U were slightly more traditional than students at New U, frequency of Internet access is similar, and students at New U report better term time access. This latter issue may be because a greater proportion of New U students are likely to live at home whereas students studying at Old U are likely to live in rented private accommodation or halls of residence. Thus, it appears that the student cohorts at Old U and New U are reasonably similar in these respects and implies that their needs, in terms of training and access to computers are similar. This will be discussed in section 8.3.3.2.1.

8.3 Students' use and opinion of the case study site

From analysis of the case study websites, there is a good fit between the aims of the lecturer and the design of the site in each case.[52] However, the fit with intended and actual student use varies in each case. Focusing on results from questionnaires, focus groups and interviews with the students the discussion below is split into three sections. In the first, the extent to which students in each case used the site in the ways intended by the lecturers will be explored and some of the potential reasons for this behaviour will be highlighted. In the second, the amount of time students spent on-line for the module of interest will be considered and the third explores a number of interrelating factors that may explain this use.

8.3.1 Goodness of fit between intended and actual use of the case study site

In case 1 (Law), the main goal of the website from the producer perspective was to enhance student motivation and interest in the subject through providing convenient access to a range of resources. To some extent, this has been achieved, for example, the quantitative data indicated that students thought the main benefit of the website

[51] Though it should be noted all three respondents lived together and shared a computer.
[52] Though it should be noted that bias may have occurred as the same researcher analysed both the interview data and the websites.

was convenient access to resources.[53] Interviewees commented on interesting features of the website, for example to learn about one another's experiences of the magistrates courts from use of the discussion board. Members of the focus group highlighted benefits of the website, such as, encouraging students to look at more resources because they were easily available, a useful resource when students did not know where to look for information and enabling students to go over material in their own time. However, a stronger theme that arose from analysis of the qualitative data was that students' primary motivation for using the website was to assist with assessment or because it was compulsory.

In case 2 (Dentistry), the lecturer described the purpose of the website as a "filing cabinet". Indeed, this aim is particularly appropriate as students' experiences varied on clinic as different clinicians taught them and they encountered particular clinical procedures at different times. The website ensured consistency of information and a useful resource, for example, if students encountered clinical procedures much earlier / later than when the procedure was covered in the lectures. From analysis of the data, students were using the website in the ways intended by the lecturer. For example, the interviewees reported using the features on the site that contained module information on few occasions, but at those rare times had found specific features useful when they had a particular query. In addition, responses on the questionnaire data highlighted benefits, primarily the convenience of access for all relevant materials and the related potential learning benefits. Similarly, interviewees and focus group members also reported using the site for convenient access to supplementary learning materials that they could then use at an appropriate time, for example, to read about and prepare for procedures they would encounter on clinic.

In case 3 (English) the lecturer had designed the website primarily to help organise the module, provide students with all the relevant resources they would need and as a means of continuing debates that arose in seminars. To a certain extent students did use the website in the ways intended by the lecturer. From analysis of both quantitative and qualitative data students found the website very useful to plan their seminars and to access a range of relevant resources. From the focus group discussions, a smaller number of students found the website provided a solid

[53] Although the response rate to questionnaire 2 is this case was low, so the results can only suggest that convenient access was a benefit.

structure that was reassuring in this sometimes complex subject. However, students did not use the discussion board in the way intended by the lecturer, indeed; very few used it at all. There were a number of reasons for this suggested by members of the focus group, largely because students already met in extra face to face meetings (without the lecturers presence but at his suggestion) to discuss issues at greater length outside the seminar and this form of communication was preferred to on-line discussions that students felt would be more time consuming and less spontaneous.

In case 4 (Midwifery), the lecturer had set up the discussion boards to encourage students to relate theory and practice, as a form of social support, to promote reflection, and encourage independent and collaborative learning. The students used the web in some of the ways intended by the lecturer. For example, from the qualitative data students highlighted the use of the board as a form of social support, to reflect on experiences, as a way to improve IT skills and to a lesser extent to share resources. In a similar vein, the themes identified from the questionnaire data include sharing resources and learning about others experiences. However, the lecturer felt that the students did not relate theory and practice or learn through active experimentation to a great extent. Further, levels of participation varied greatly amongst the group, with some students never accessing and / or contributing to the boards. There are likely to be a variety of interrelating factors at work. Firstly, students may have had difficulties in linking theory and practice if this was not something they had done before, or was not promoted by all lecturers. Lack of participation may be due to factors highlighted from the qualitative data: difficulties with access, the public nature of the board, personal preferences, a lack of time and a dislike for collaborative learning. Moreover, participation was not assessed and students may not have seen the facility as having an obvious assessment benefit. Indeed, students in the focus group did not think that the WebBoard would help them get better exam marks.

In case 5 (German), the lecturer's primary aim was for students to have an opportunity to improve their written communication skills, through on-line discussions about German culture, and to overcome a reduction in contact hours. Indeed, from analysis of qualitative and quantitative data the students reported primarily using the discussion board to enhance their understanding of German culture and improve their key writing skills, yet did not use the remainder of the

website (but nor was this promoted/ stressed by the lecturer). Assessment had been a primary motive for students to use the discussion board in the way they did, indeed, it is unlikely that students would have used it to the same extent had it been voluntary due to the small number of students, the close knit nature of the group, and the prioritisation of assessed work across the degree programme. Though, from the focus groups, interviews and the more qualitative components of the questionnaire data, it appeared the students did perceive some educational benefits of using the discussion board: the opportunity to discuss topics in depth, to construct an argument, and to improve written communication skills. Likewise, the lecturer felt assessment was an important motivator and thought the students' grammar and language skills had improved (but noted that it was hard to quantify if they would have improved to the same extent if she had set similar paper-based tasks).

In case 6 (Cultural Studies), the principal aims of the case study site were to: act as a form of module organisation, to encourage reading, to enhance discussion of difficult topics, and improve communication skills. To some extent students used the website in the ways intended by the lecturer. From analysis of the quantitative and qualitative data the most used part of the website was the discussion board and students noted several benefits: sharing opinions, learning about different cultures and improving writing skills. Nevertheless students' primary motivation was assessment. Indeed, the lecturer felt that the students appeared to be more strategic and less intrinsically motivated than previous cohorts, thus the quality of discussion was more politically correct and assessment conscious. Despite this, the lecturer felt the medium was particularly worthwhile for students who found it difficult to participate in face-to-face discussions. From the qualitative data, it appears that the on-line MCQs designed to encourage reading did not achieve their purpose to a great extent. Again, a reason for this behaviour from the interviewees was the need to prioritise tasks that were assessed, as there were other, often more social interests that took precedence over "extra" work.

8.3.2 Amount of time students spent on-line

From examining responses to questionnaire 2, students do not report spending a great deal of time on-line for the case study modules. The amount of time spent on-line may be even less than discussed here as students may over estimate the time they spent using the medium. The most frequently accessed and most used website was

the site developed in case 6 (Cultural Studies), which involved the use of the web as a partial replacement of the face-to-face teaching and was assessed. In case 6, students reported typically accessing the website two to three times a week; with the majority of students estimating that they spent 40-60 minutes on-line per session. In contrast, the website in case 2 (Dentistry) was designed as a purely voluntary supplement to the module and reportedly used for a smaller amount of time and least frequently. In this case students typically accessed the site for 0-20 minutes per session on a monthly basis. In only two cases, case 3 (English) and case 4 (Midwifery), was there a relationship between the amount of time spent on the website per session and the frequency with which students reported accessing the case study website, where the shorter the period of time students reported using the website the more frequently they accessed it (see section 11.4).

Despite what appears to be a small amount of on-line use this does not directly relate to students having a poor opinion of the use of the web in each module. For example, students were asked to rate their agreement to the Likert style statements on questionnaire 2 on a scale from 1 (strongly agree) to 6 (strongly disagree) with the statements, "*I enjoyed using the web for this subject*", "*using the web for this module was well worth the time I spent on it*", "*using the web for this module helped me to learn about the subject*" and "*using the technology will help me to get more marks.*" Looking at the median responses students in all cases (except case 5, German) enjoyed using the web with median responses for cases 1 to 6 as 3, 2, 2, 3, 4 and 3 respectively. Similarly, students thought the web was worth the time they spent on it (except case 4, Midwifery) with median responses for cases 1 to 6 as 3, 2, 2, 4, 3 and 3. Students' opinions about whether the web helped them to learn were more mixed, in general, students in cases 2 (Dentistry), 3 (English) and 6 (Cultural Studies) thought it did with a median response of a 2, 2, and 3 respectively. In contrast, students in cases 1 (Law), 4 (Midwifery) and 5 (German) did not think the web had helped them learn more for the case study module with median responses of 4, 4, and 5. Students opinions on whether the use of web helped them to get more marks was similarly mixed with students in cases 2 (Dentistry), 3 (English), and 6 (Cultural Studies) rating their agreement as a 3 in each case but for the remaining cases 1 (Law), 4 (Midwifery), and 5 (German) the median responses were 4, 5, 4 respectively. Although examining these statements only gives some indication of

students' views[54] it is interesting to note that amount of use does not obviously correspond to students' agreement with these statements. For example, looking at the median levels of agreement on case 2 (Dentistry) students rated the website the most positively on all aspects but generally reported spending the least amount of time on-line. Students in each case who took part in the qualitative data were also positive about the websites but this is to be expected, more enthusiastic students may take part in the study and may also be trying to please the researcher. Positive responses for all types of data may also be linked to a generally positive view of the module or lecturer, a "halo" effect could be present. Interrelated factors that may contribute to the amount and type of use are discussed in section 8.3.3.

This limited amount of on-line use may be, in part, as a consequence of students doing work off-line that is related to the material found on the website. Indeed, from looking at the qualitative data this behaviour was reported in many of the cases. For example, students reported printing off relevant material to use at a later date. This was sometimes due to the preference of reading on paper as oppose to on screen or, particularly for the dental students in case 2 (Dentistry), the need to have the information available to them at a later date, e.g., just before carrying out a new procedure on clinic. By printing off material from the websites the students could ensure they would always have the information when they required it. It is interesting that students reported using the medium in this way, when a benefit of the Internet that is often cited is that it aids learning at any time in any place. These students used a printed sheet for the same purpose, which, from their perspective, worked better in this circumstance than a website. A second example of work that was carried out off-line was in case 5 (German), where students prepared postings to the discussion board off-line, as their contributions were assessed. The relationship between off-line and on-line behaviour in this study cannot be measured to any great extent, and the use of student diaries may have helped in this regard – see chapter 9. Differences between the amount of time spent on–line may also relate to the activities students had to carry out. For example, in cases 1 (Law), 4 (Midwifery), 5 (German), and 6 (Cultural Studies) students would read contributions on-line.

[54] Further, in some cases the responses to these statements were mixed (e.g. in Case 4, Midwifery) and in case 5 (German) the sample was very small.

8.3.3 Factors influencing student use of the case study sites

Student use is very complex and there are a variety of interrelating factors that have a role in influencing the amount students' use the websites and the particular features they use the most / least. Some of these factors: time, perceived value, access and usability are discussed below. Further, the significance of these (and other factors) will vary depending on the individual, the specific social context and the individual's perception of that context.

8.3.3.1 Prioritisation / perceived value of the website

One of the most central issues influencing students' use is time. Unsurprisingly, students prioritise work as a consequence of the time they have available. There are a variety of competing pressures on time that became particularly apparent in analysis of the qualitative data for each case.

Particularly in cases 2 (Dentistry) and 4 (Midwifery), but to a lesser extent in case 1 (Law), students discussed the large time commitments that were required for their course. Interestingly, this theme was most apparent in cases 2 and 4. For these degree programmes students tended to have a larger time commitment as a result of having to learn on clinical placements in addition to the standard university education of lectures and seminars. These students had a far greater number of contact hours with less holiday time than students following the typical academic calendar.

In case 5 (German), modules other than the one of interest took priority, and students made a strategic decision about how much time to allocate to the particular case study module in relation to the remainder of the degree programme. For example, from the qualitative data one student explained how German was his strong subject and therefore he believed it required less attention than others. In contrast, for another student German was one of his weaker subjects and chose to concentrate his efforts elsewhere where he believed he could get more marks.

Students who took part in the interviews in cases 1 (Law) and 6 (Cultural Studies) or the focus group in case 4 (Midwifery) stressed social commitments that they prioritised over the voluntary use of the web. Interestingly, all these cases involve first year students, and this is perhaps why the social aspects of university were considered to be more important. Typically the first year of university is viewed as a

social one, where students do the least work. Indeed, in case 1 (Law), the lecturer (despite placing extra resources on the web to try and promote interest and enthusiasm amongst students) commented that first year students might be the least likely of all the year groups to use the resources.

From exploring the relationship between intended and actual use of the case study modules it can be seen that assessment is an important motivator for how each website was used by the students. Assessment was a clear factor when the use of a particular feature on a website was compulsory / necessary, students felt that a particular feature would help them with their assessed work, or assessed work was prioritised over the use of the supplementary, often perceived as "extra" features on the website. Indeed, students in cases 1 (Law), 3 (English), 5 (German) and 6 (Cultural Studies) who participated in the qualitative parts of the research reported a motive for using a feature of the website because they were required to and / or it was assessed, in cases 1 (Law), 2 (Dentistry), and 3 (English) interviewees pointed out specific features of the website that would be of direct relevance to an assessed piece of work, either now or in the future (such as exams). Other assessed work across the degree programme took priority in all cases over what students perceived to be the more supplementary aspects of the medium.

For example, in case 1 (Law), the two features that were used the most / and perceived to be the most valuable by interviewees were the external links that were directly related to the lectures (i.e. links contained within the web-based lecture notes) and the discussion board. Two main reasons were assessment and compulsion. The external links were most likely to help the students with assessed essays, as they were considered to be valuable, directly relevant sources that were quick and easy to access. External links that were perceived to be of more obvious help in assessment were used more / perceived to be more valuable than others, such as, links to relevant newspaper articles, which, while seen as beneficial, was not seen as a central resource and not used or likely to be used as often. A main motivation for using the discussion board and use of the on-line surveys was because they were asked to, and, although it was not assessed, students were aware the lecturer could, and did, track participation. Further, interviewees stressed the priority of completing course assignments and, as noted above other, typically social, commitments.

Although assessment / requirement to use an aspect of the site was typically a central motive for students to use the web, students often perceived there to be educational benefits of these features. This is not unsurprising as lecturers will often assess components of a module that are of particular importance / of value to the students. For example, from the qualitative data in cases 1 (Law), 5 (German) and 6 (Cultural Studies) where students had to contribute or their contributions to the discussion boards were assessed, the students raised other advantages of using the boards. In case 1 (Law), interviewees were interested in sharing and finding out about others opinions. In case 5 (German), an interviewee discussed how he had enjoyed learning about others ideas (particularly those from German students). In case 6 (Cultural Studies), the interviewees thought the benefits of using the board included seeing others opinions, learning about different countries and cultures and practicing writing skills. As a further example, in case 3 (English), interviewees reported that the most well used part of the site was the week-by-week section, to prepare for the weekly seminar. Students were required to do this (as it was the only place students could access the information) but they also rated the feature very positively.

Where students perceived a direct learning benefit the use of the feature did not need to be assessed for it to be used. In case 2 (Dentistry), the main reason for using the website was for specific features that they felt were of particular value to them. In this case, the most used part of the site was a text based learning resource that students utilised to prepare prior to carrying out a procedure on clinic. The majority of interviewees reported that they printed the document out to use at a later date when they needed it. Lecture notes were used in a similar way by a third of interviewees to prepare for the lectures. Although these text based materials had often been given to students elsewhere, this ensures all students have access to a copy. Similar to other cases, assessment was still an important factor, for example, interviewees highlighted other parts of the site, such as the on-line vivas, that were not used at present yet would be useful at a future date just before taking their final exams.

Similarly, in each case there were parts of the websites that students did not use that often (if at all) because they did not perceive them to be of great value. All five of the case study websites had sections containing module information. In each case, the majority, if not all, of this information had been given to students elsewhere. From

the qualitative data, some students could see the potential value of having such material on the site, for example, if one lost the paper based version, needed to know something immediately, and for completeness. However, very few students reported using these sections of the site, or that they would be likely to use them in the future. This is not surprising, it is typically information students only need to look at once and they already have it on paper, indeed, usually the lecturers did not see the dissemination of this kind of information as a key reason for designing the site. This kind of information is probably more useful for management procedures such as QAA. Similarly, text based materials were not used, in general, if students did not perceive them to be of value (particularly in terms of assessment), or if they already had the item on paper.

The extent to which the web added to students existing workload varied between modules and amongst students. For example, in case 3 (English) the students in the focus group reported that they had found the website had saved them time accessing resources and preparing for seminars (accept for those with accessibility problems) and helped with course organisation. For students in case 4 (Midwifery), students in the focus group thought the use of discussion boards had added to their workload, perhaps because it was not directly and obviously used in another part of the course, such as resources for assessed essays. Related to this issue is students demand for more resources to be placed on the sites that was apparent in analysis of qualitative and / or quantitative data in cases 1 (Law), 2 (Dentistry), and 3 (English). This demand may be for several reasons: it could be because students want to know the sources are there, for comfort even if they do not use them, or they do not know what else to ask for, and are maintaining the current culture. Indeed, it is interesting that this theme was most prevalent in all the cases at Old U where provision of extra resources was an important aim in each case. However, perhaps the most likely reason for this request is to ensure that students can optimise the use of their time spent on the web, and the minority of students who have problems with access need to be sure it is worth the effort to go to the web, not to access the site and find the desired items are not available. However, there is a risk that the more complex the sites become the more difficult students may find it to locate specific sources.

Given the amount of time lecturers put into such initiatives (discussed in section 8.5.2), and for the benefit of students, lecturers may encourage an increased amount

of use of the website through assessment. However, students will still use the websites in the way they perceive to be the most useful to them. Assessment can encourage students to use specific features of the site. However, direct assessment (for example of contributions to discussion boards) can work in both positive and negative ways. From analysis of the cases here, assessing contributions to discussion boards has three main advantages: it encourages everyone to participate, highlights the value lecturers place on this activity and ensures students think about and consider their contributions carefully. However, there are difficulties: assessment results in a lot of postings that say the same thing (particularly in larger groups), postings may be written with assessment in mind, for example, are politically correct and non-controversial in order to please the lecturer, and may lead to a forced and poorer level of debate. Finally, from the lecturers' perspective, how postings can be assessed in a meaningful way is problematic and the time involved in marking contributions can be considerable.

There are two other factors that may enhance students' use of the websites, and consideration of these factors may lead to more effective and efficient student use. These are access and usability.

8.3.3.2 Accessibility

8.3.3.2.1 Skills to use computers

As discussed in section 8.2, the majority of students in each of the six cases report that they are frequent users of the WWW. While this data is useful, frequency of use does not imply ability to effectively use the web for the module. Indeed, only a minority of students in all cases (except case 5, German) reported having any formal training in the use of the web prior to the start of the module. At Old U, 82% of students in case 1 (Law), 76% of students in case 2 (Dentistry) and 82% of students in case 3 (English) did not.[55] Similarly in cases 4 (Midwifery) and 6 (Cultural Studies) at New U 86% and 85% of students reported having no formal training respectively and in case 5 (German) 33% of the students reported having no formal training in the use of the web.

On questionnaire 2, when students were asked to rate their agreement or disagreement on a scale of 1 (strongly agree) to 6 (strongly disagree) with the

[55] Though case 3 may be a skewed sample due to the questionnaire being conducted via email.

statement, "*I would have liked more training in the use of the technology before I began this module*," the median response in each case was a 4 or lower. Thus the majority of students did not feel they needed more training. However, in each case (with the exception of case 5, German) there were a significant minority of students who would have liked more training. In cases 1 (Law), 2 (Dentistry), 3 (English), and 6 (Cultural Studies) around 40% of students agreed with the statement and in case 4 (Midwifery) around 25% of students would have liked more training at the beginning of the module. Interestingly, case 4 was the only case where students received a dedicated two hour training session for all students from the central unit. In the other five cases training tended to be more informal and provided by the lecturer.

From the qualitative data, one factor highlighted in discussions with students in cases 1 (Law), 3 (English), and 5 (German) was students' awareness of a lack of quality control on the Internet, and appreciation of external links being selected by the lecturer. However, in cases 1 (Law) and 5 (German) students still felt that even if the source was not "true" as long as they referenced it, it did not matter about the quality. Other issues raised by students in cases 2 (Dentistry) and 3 (English) was the feeling over being "overwhelmed" by the sheer amount of information on the web and navigating and using such material appropriately.

Students who perceive themselves to have limited skills may be put off using the technology at the start of the module and feel they are missing out, or unlikely to benefit. Indeed, when looking at the relationship between the desire for more training and other responses to the Likert style statements of questionnaire 2, using Kendall's Tau in all cases (except 5) agreement with the statement, "*I would have liked more training in the use of the technology before I began this module*" is positively and significantly related with agreement with the statement, "*the website was difficult to operate.*"[56] Agreement with the statement regarding training is related to other statements for different cases. For example, in case 2 (Dentistry) it is positively and significantly related to the statement, "*using the web for part of this module meant that I didn't get to know my tutor as well as I usually do.*" It is also related to agreement with the statement, "*using the web for part of this module meant that I didn't get to know the other students in my class as well as I usually do*" in case 4

[56] Kendall's Tau was not calculated on case 5 (German) as statistical analysis could not be carried out in this case due to the small sample.

(Midwifery). Finally, it is significantly and positively related to agreement with the statement, "*I don't want to have more modules that involve the web*" in cases 1 (Law) and 2 (Dentistry) (see section 11.4). Thus, while some skills highlighted here, such as evaluating Internet sites, may be too advanced a skill to expect (particularly for first year students) the assumption that everyone knows how to use the medium is problematic, as it is apparent there are some students who are not frequent users of the web and many have not had formal training. This issue is discussed further in section 8.6.

8.3.3.2.1 Access to computers

From analysis of the data from questionnaire 2 it appears that access was not a problem for students in five of the six cases. For example, when students were asked to rate their agreement with the statement, "*I could always access the web for this course when I wanted to,*" on a scale of 1 (strongly agree) to 6 (strongly disagree) the median agreement was a 2 or 1.5. In case 4 (Midwifery), access was reported to be more difficult where the median response was a 4. From analysis of the focus group data this rating may reflect the difficulties some students had encountered when attempting to access the web from their clinical placements (although all could use the facilities at the university). Despite this apparently positive picture, a sizable minority in four of the remaining five cases also reported problems with access. In cases 1 (Law) and 2 (Dentistry) approximately 40%, in case 3 (English) 20%, and in case 6 (Cultural Studies) 35% of students disagreed with the statement. Students in case 5 (German) reported no problems with access perhaps because, as is apparent from the qualitative data, all the students lived together and had Internet access at home.

From analysis of the qualitative data, students thought that, in general, Internet access at both Old U and New U was acceptable, though the computer labs could get very busy at certain times. For some students, particularly those on clinical degree programmes, i.e. cases 2 (Dentistry) and 4 (Midwifery), time was also a problem due to the large amount of time spent on clinical placement. In case 2 students only had a limited number of hours each week they could access university computers (which may be booked up by other lessons) and in case 4, finding time to go off the wards to use the computers was, for some students, difficult. Experiences in all cases varied, and seemed to depend a great deal on when students were prepared to go and access

the computers (typically at inconvenient times) and in some cases the prioritisation of this task over others. For example, in case 4 (Midwifery), students in the focus group highlighted their preference for taking a break between lectures and talking to friends as oppose to using the university computers. Other difficulties with access frequently identified in the qualitative data analysis were problems with printing, slow computers, difficulties with passwords and the costs of using the computer at home. Access is important, for example, when exploring the relationship between the various Likert style statements on questionnaire 2 (using Kendall's Tau) in three cases 1 (Law), 4 (Midwifery), and 6 (Cultural Studies) agreement with the statement, "*I could always access the web for this course when I wanted to*" was significantly and positively related with agreement with the statement, "*using the web for this module helped me to learn about the subject.*" Provision of better access and improving training opportunities for students does not directly or necessarily link to increased amounts of students use or lead to higher evaluations of the website, but increasing the ease with which students can access the site and improving their skills in this area may encourage students to see the web as an efficient and effective medium to use for the module.

8.3.3.3 Usability

From analysis of each of the case study websites, the usability of each case study site, encompassing navigation, presentation and structure was, overall, good. There was a clear relationship between proposed usability good practice guidelines (see section 11.1 in the appendix) and students opinion of the site as determined through both qualitative and quantitative data. Thus, usability was unlikely to negatively affect the students' use of each of the case study sites. For example, from examining the data on questionnaire 2, where students were asked to rate their agreement on a scale from 1 (strongly agree) – 6 (strongly disagree) with the statement, "*the website was difficult to operate,*" the median response rates for all cases was 5 or lower. Similarly, median responses of agreement with the statement, "*the website was well presented,*" was a 3 or higher in each case. Indeed, presentation of the website is important. For example, in three cases, 1 (Law), 2 (Dentistry) and 6 (Cultural Studies) students agreement with the statement, "*the website is well presented,*" was positively related to, "*I enjoyed using the web for this subject,*" - though this relationship may simply indicate a generally positive view of the web for the module.

8.4 *Staff and student relationship*

In this section the findings from the data from both students and staff are discussed to consider if the use of the web had a significant influence on relationships between students or between staff and students. The first part considers the student – student relationship and the second the student-staff relationship.

8.4.1 Student – student relationship

From analysis of the qualitative and quantitative data, the majority of students in each case did not think the web had a negative effect on their relationships with other students. For example, in questionnaire 2 students were asked to rate their agreement with the statement, "*using the web for part of this module meant that I didn't get to know the other students' in my class as well as I usually do*," on a scale of 1 (strongly agree) to 6 (strongly disagree). The median response in each case was a 4 or lower. This is to be expected in cases 1 (Law), 2 (Dentistry), 3 (English), and 4 (Midwifery) where the web / discussion was used as a supplement to the existing course. However, the use of the WWW may be more likely to have a negative effect where the web had been used to overcome reduced contact hours (in case 5, German) or where the web had been used as a partial replacement to face to face seminars (as in case 6, Cultural Studies). The median scores for these two cases were 5 and 4 respectively and in case 5 (German), the median response is similar to other cases. This may be because students had already known each other for three years and lived together. In case 6 (Cultural Studies) the median response is a 4, which is slightly higher than other cases (that are all 5 or lower) and this may be due to the replacement of class time.

The use of discussion boards did not lead to students getting to know each other better. This is perhaps surprising, as in cases 1 (Law), 3 (English), 4 (Midwifery), 5 (German), and 6 (Cultural Studies) students were expected to share and learn about theirs and others opinions or experiences on certain topics from participating in the on-line debates. From analysis of the qualitative data this has not been the case and there may be a number of reasons for this. A primary reason was that students saw no need for the website to fulfil this purpose. For example, in case 2 (Dentistry), interviewees explained how they had not used the bulletin board because obtaining information and / or learning from friends in their year and years above was particularly important and worked well. In case 3 (English), members of the focus

group noted that the nature of the module and the way it was taught (i.e. a face to face seminar with the lecturer and discussions amongst students) meant that students already felt they knew each other quite well and students preferred the spontaneous nature of face to face discussion.

A theme that arose from qualitative data regarding students' on-line behaviour in cases 1 (Law), 4 (Midwifery) and 6 (Cultural Studies) was the way students did not tend to connect the on-line discussions with face-to-face contact. In each of the three cases students discussed how, while on-line they may have noticed names on the discussion board they did not then link this to the student or help them get to know the student in face to face situations. On-line discussions did not translate into face-to-face conversations, for example, students would discuss on-line with others they did not normally speak to but would not then begin to speak to that person face-to face. In case 6 (Cultural Studies), interviewees felt that on-line discussion mirrored face-to-face interaction, i.e., students would only engage in on-line discussion with students from the same seminar group. In all cases there was a very limited amount of face to face discussion about the website / discussion board and the conversations that did take place were often in terms of assessment, about a useful feature, or what to write for on-line contributions, not the content of the on-line debates.

8.4.2 Student - staff relationship

Similarly, from the student perspective, the use of the web did not have a negative effect of the student – lecturer relationship. On questionnaire 2 students were asked to rate their agreement with the statement, "*using the web for part of this module meant that I didn't get to know my tutor as well as I usually do*" on a scale from 1 (strongly agree) to 6 (strongly disagree). The median rating in each case was a 4 or lower. From the qualitative data, the majority of students did not think the use of the web led to the students getting to know the lecturer any better or enhancing the relationship, the web seemed to be a reflection / reinforcement of the kind of lecturer the students already perceived them to be. Indeed, in case 3 (English) the case study lecturer explained how he wanted the students to know he was organised, reliable, in control and always contactable, indeed, this was perhaps particularly important given the nature and structure of the module. Similarly, in case 4 (Midwifery) the lecturer already used a very student centred approach in her teaching, thus the use of on-line discussions was merely an extension of that. Frequently, the students who took part

in the qualitative aspects of the research in each case volunteered what a high opinion they had of the lecturer, it was clear that the students thought these individuals were already good lecturers and the website was just one aspect of that.

In cases 5 (German) and 6 (Cultural Studies) where the web had been used to overcome a reduction in class contact time and replace some of the seminars respectively, the lecturers felt the web had not altered their relationship with students in a negative way. In case 5 (German) the lecturer thought it was because of the small intensive teaching methods used in the face-to-face classes. In case 6 (Cultural Studies), the lecturer did not think that his relationship with the students had changed though he found out more about them from reading their on-line opinions, despite the more politically correct nature of students discussions. Again, perhaps this was due to the seminar based, discursive nature of the face-to-face classes.

The extent to which the lecturers contributed to the on-line discussion boards varied in each case. In case 4 (Midwifery), the lecturer got most involved, sharing opinions and experiences, answering queries as well as ensuring postings were acceptable. In cases 1 (Law), 5 (German) and 6 (Cultural Studies) the lecturers deliberately did not get too involved, providing a space for students to discuss freely, merely ensuring students knew they were reading the contributions and policing its use if necessary, concluding topics and introducing new ones. Cases 3 (English) fell in between the two extremes. From the qualitative data some tension could be identified between the students' desire for more input from the lecturer, as they valued their expertise, were interested in their opinions and experiences, and wanted to know what the lecturer's thought about the on-line contributions. Yet they also wanted to keep the on-line discussions a fundamentally student zone. For example, students in the focus group in cases 3 (English) and 5 (German) discussed how the more involved the lecturers were the less free students felt their discussion might be. For example, in case 5 students in the focus group thought more contributions from the lecturer would be beneficial, increasing the number of participants, enhancing interest and helping even out the gender balance in group, yet this was believed to make it more difficult for some students to put their own opinions across as it felt like "talking back."

Thus, the majority of students and lecturers did not feel the use of the web had a significant influence on relationships between staff and students. However, there was

a strong significant relationship between level of agreement with the statements, "*using the web for part of this module meant that I didn't get to know the other students in my class as well as I usually do,*" and, "*using the web for part of this module meant that I didn't get to know my tutor as well as I usually do,*" in all cases (see section 11.4). Thus, for those few students who agreed with these statements they were likely to feel that the web had had a detrimental effect on both relationships between staff and those between students.

8.5 Factors influencing adoption of the use of the web in teaching and learning

In this section data from both students and staff are considered to explore three factors that may influence the extent to which the web is adopted in teaching and learning for campus-based students: the level of institutional support, the influence using the web has on lecturers workload, and student demand for increasing the use of the web in teaching and learning.

8.5.1 Institutional support

At Old U, all three innovators had been using technology in their teaching for a number of years and initially all were using technology without school or university level support. At the time of the research, there was some support for such initiatives in cases 1 (Law) and 2 (Dentistry). For example, in case 1 the lecturer had made use of the university projects and the approved MLE and in case 2 the lecturer's school had invested in the infrastructure and appointed staff with appropriate expertise. The third lecturer had no support, though did not feel he required it. Of all three cases, Dentistry appears to have the most support and English the least and this may be due to subject differences, i.e., factors such as different departmental cultures, general beliefs concerning where technology can be used appropriately, student expectations and financial factors (e.g. Dentistry may have a more lucrative CPD market). Despite some institutional support, the innovators in cases 1 and 2 had invested a great deal of time into these projects with few institutional rewards (e.g. a reduction in teaching hours or financial benefits) and the lecturer in case 3 (English), had also invested a lot of personal time - though he felt the use of the web had saved him time overall. In cases 1 (Law) and 2 (Dentistry) the innovators were encouraging appropriate use of the web in teaching and learning across their school with the assistance from the school and/or university support available. In case 3 (English) the lecturer was the

main pioneer within his department and at the time of the research had taken on the responsibility for creating department web pages for the staff and students. Interestingly, none of the innovators believed that all staff would begin to use technology in their teaching (despite there being more resources available in cases 1 and 2). In case 1 (Law), this was due to the lack of incentives and difficulties with using the university approved MLE. In case 2 (Dentistry) because of the lecturers love of giving lectures and a lack of belief in the value of the medium. In case 3 (English) reasons included, a lack of investment, conservatism, a lack of incentives for staff and a lack of skills (similar to case 1).

At New U, all three innovators were currently part of the central projects scheme, and for the lecturer in case 4 (Midwifery) this was the first time she had used technology in her teaching. Similar to Old U there were few institutional incentives for the case study innovators to use technology within teaching and learning, and there were subject differences in the level of school support and interest in each initiative. In case 4 (Midwifery), there was a very limited amount of support available and the project, for the most part, was an addition to her existing workload. Indeed, the assistance (both emotional and practical) she received from the central unit was particularly important in this case. After the start of her project relevant school strategies, with some investment attached, had been introduced. Cases 5 (German) and 6 (Cultural Studies) were both located in the Business School, and the level interest in such initiatives for both campus based and distance learning students, IT support and infrastructure was good. However, a lot of work, e.g. website development, was done by the innovators, though, currently both innovators held teaching fellowships and the lecturer in case 5 (German) was employed to spend half her time on such initiatives. Similar to Old U the CPD market in Business is likely to be particularly strong. Finally, students' expectations may differ in Business, Languages and Midwifery. Again, similar to Old U despite some school level and / or institutional support these innovators did not think all staff would adopt such initiatives, typically for similar reasons. In case 4 (Midwifery) reasons were: high workloads, resistance from staff to more student centred approaches to teaching, a lack of incentives and it seen as a "flavour of the month." Similarly in case 5 (German) the main reasons were due to a lack of time and institutional rewards and finally, in case 6 (Cultural Studies) resistance to change (as in case 4), feeling

disenfranchised with the university and suspicion of a higher workload (similar to cases 4 and 5).

8.5.2 Time

In all except two cases, 3 (English) and 5 (German), the lecturers reported that the use of the web in their teaching had taken more time than traditional methods, often a considerable amount more. In case 4 (Midwifery), the lecturer estimated she spent an average of ten hours a week to moderate an on-line board on top of her existing workload. The lecturer in case 6 (Cultural Studies) stated that moderating a discussion board was so time consuming he found it difficult to moderate more than one board per term. In case 5 (German), part of the lecturer's job was to use technology and promote its use in teaching and learning within the school. In her experience acting as a mentor and mediating the boards took as much time as a similar task in "traditional" teaching. In case 3 (English), one of the reasons the lecturer had decided to use the web was to save him time. Interestingly, he was the only one who found it did save time, for example, by providing a basis from which to build and improve the module on a yearly basis, as a means for all students to find all the resources they required, thus saving him time photocopying, and as a mechanism to handle queries from students thus not interrupting his work at awkward times. However, students in this module did not use the discussion board a great deal, if they had this may have had greater time pressures. In all cases very little, or no reduction, was made to lecturers existing workload and, if increasing not saving time is a common event, this will have implications for adoption by a greater number of academics.

8.5.3 Student demand

From examining the results from the qualitative and quantitative research there is some student demand for the WWW to be used in more modules. In questionnaire 2, students were asked to rate their agreement with the statement, "*I don't want to have more modules that involve the web,*" on a scale of 1 (strongly agree) to 6 (strongly disagree). The median level of disagreement for each case was a rating of 4 or lower. However, there were a significant minority in each case that agreed with the statement, in case 1 (Law) almost 40% of students, in case 2 (Dentistry) 20% of students, in case 3 (English) 25% of students, case 4 (Midwifery) 45%, and in case 6 (Cultural Studies) 30% of the students agreed with the statement. These students may either be happy with the current level of web resources or wish it to be reduced.

From analysis of the qualitative data the demand appears to be for more lecturers from other modules to be involved, such as in cases 1 (Law) and 2 (Dentistry).

Despite some demand from students for the WWW to be used as a supplement there was an overwhelming lack of demand in all six cases for the web to be used as a replacement for existing face-to-face teaching methods. There were a number of reasons for this: the preference for learning face to face, a lack of motivation / skills necessary to benefit from on-line learning, lack of appropriate infrastructure, and the more social functions of university life.

In every case students participating in interviews and / or focus groups stressed their preference for learning in face-to-face situations compared to a computer screen. Students felt they learned better in social situations for a variety of reasons, for example, some found even the more didactic side of teaching such as lecturing, when it was good, more interesting than reading off screen. Through face-to-face contact, students felt they could be guided through the material, would learn from the non-verbal aspects of communication as well as ensuring that the potential misunderstandings that could arise without the lecturer being present did not take place. Students felt they needed social interaction to learn, some students highlighted how they needed to discuss their topic with someone before they fully understood it, and to help develop their ideas. Interestingly, students from the two clinical subjects, cases 2 (Dentistry) and 4 (Midwifery), felt that the web was a particularly unsuitable medium because of the practical nature of what they were learning.

A further issue raised by students taking part in interviews and focus groups in cases 1 (Law), 2 (Dentistry), 3 (English), and 6 (Cultural Studies) was the lack of skills they possessed in managing their own time that on-line learning would require. Students noted that they would find it hard to do the work without the motivation arising from the routine of attending lectures and seminars. Thirdly, students from cases 1 (Law), 3 (English) and 5 (German) did not think that their university had the level of infrastructure required for on-line learning to be successful and, members of the focus group in case 3 pointed out lecturers rarely possessed the necessary skills. Students in three cases, 1 (Law), 4 (Midwifery) and 5 (German), stressed the importance of the social aspect of university, i.e., that university was not just about learning about the subject. Finally, students in case 3 who participated in the focus

group (perhaps notably English students) felt they already had too few contact hours with their lecturers.

Although the lack of demand for the web to become a replacement to existing teaching methods was apparent in all cases, there were students from two cases that could see some benefits of such a move. In case 3 (English), students raised the possible flexibility the form of learning could offer and in case 5 (German) students discussed the potential that this method of learning may have to overcome some of the cost implications that now had to be considered when entering university, potentially being cheaper than face to face teaching and allowing students to work at the same time. Despite these potential benefits students did not want their teaching replaced by on-line methods.

Thus, from this section it is clear that, if universities wish to use the web in teaching and learning in the ways summarised here there are a number of difficulties. Currently, the use of the web would not be adopted by the majority of staff, for a number of reasons, principally the fact it is likely to add to existing workloads. Indeed, to use the web as a supplement such as the ways discussed here may be difficult for students to cope with, for example, having to contribute to five discussion boards (one per module) per semester in addition to the existing course. Such a move also requires a great deal of investment, in infrastructure, support for staff and to free up staff time. One way the use of the web could be more financially viable is through the reduction of contact hours and increasing the emphasis on resource based, independent learning, but from the student perspective this is clearly not desirable. These factors will be considered in greater detail in chapter 9.

8.6 Conclusion

As can be seen from the discussion above there are few differences between Old U and New U, though subject differences are slightly more apparent. The web in each of these cases has been used to improve a particular aspect of the module. In no case has the use of the web fundamentally changed the way a module is taught. In the main, the existing teaching structures remained in place, typically the web is a supplementary resource and in only one case, case 6 (Cultural Studies), was some of the face-to-face teaching replaced by the use of the web. Further, a lot of what

students could do on-line, such as locate and use resources and take part in discussions, is similar to tasks that students in an entirely face-to-face course would carry out (although obviously there are some differences, such as in the skills required). In addition, the web did not significantly alter (in either a positive or negative way) relationships between staff and students.

The incentives for all the innovators in each case were largely personal, such as, enjoyment, interest in using technology and / or more innovative teaching methods. From the student and author's perspective these lecturers were excellent at their job and cared about what they did. Their central reasons for using the WWW were to enhance the educational experiences for students. Crucially the use of the web was only used where it was thought to lead to benefits for students. But it is likely these lecturers would have enhanced their teaching in other ways had the WWW not been available. In chapter 9, how and why the WWW has been used in each of these modules will be considered in the light of the policy documents and other relevant literature that views the WWW as the solution to many of the problems the higher education sector is currently facing.

While students' use and opinions of the case study site will vary depending on the individual, the social context and how students perceive that context, what is striking from the analysis of data is the extent to which students' use is determined by the benefits they think they will gain. This is clear from examining the features of the site students used and their reasons for doing so. The factors influencing this behaviour were related and complex (e.g. other commitments, assessment, accessibility and usability) and the combinations of these and other factors not explored here are likely to vary in significance for each student. Using the website to fulfil specific needs is also apparent when exploring the influence the web had on relationships between staff and students -the majority of students did not look to the web to fulfil this function as they formed social relationships elsewhere. Students' use of the web for each case study module had a great deal in common with the Uses and Gratifications model of communication.

In the Uses and Gratifications model in communication research, the audience is viewed as active and their media use depends on their motivations for engaging with the media, the needs they seek to fulfil and the satisfaction they will gain from use.

These needs and gratifications have been classified in a variety of ways, and typically originate from social or psychological factors (McQuail, 2000:387) and the media compete with a variety of other ways people could fulfil these needs. The philosophy behind the approach can be described as follows:

> Personal circumstances and psychological dispositions together influence both ...general habits of media use and also...beliefs and expectations about the benefits offered by the media, which shape...specific acts of media choice and consumption, followed by...assessments of the value of the experience (with consequences for further media use) and, possibly...applications of benefits acquired in other areas of experience and social activity.
>
> (McQuail, 1987:235 cited by Chandler (1994:2)).

While there is some debate as to when this approach first began in the history of communications research, it was in vogue in the 1960s and 1970s. More recently, Uses and Gratifications has again been used in some studies of the use of new media, as the audience in this case is considered to be particularly active, as they actually have to engage with the media, for example navigating through websites, and audience use may be explicit and intentional. Indeed, this approach is most appropriate in cases such as this, when investigating specific content where particular motives are apparent (McQuail, 2000:389).

There are a number of justified criticisms with this approach, for example, the way that needs are defined, the reliance on self report data, and that the model is merely a data collection strategy not a theoretical approach (Severin and Tankard, 1988:306-308). The principle advantage was that, when first developed, it opposed the effects theories of mass communication prevalent at the time, where the media was thought to have an obvious and direct effect on the audience (who were treated as passive). The approach demonstrated a variety of different needs and motives an audience had for watching a particular programme or genre and could help explain differences in the likely effects the media could have (Severin and Tankard, 1988:303). This is similar to the work here that counters the sweeping, generalised statements about the benefits the use of new technologies will have for students, typically found in the technologically deterministic literature. This issue and the value of using a simple communications model employed here in further studies will be discussed in chapter 9.

From an institutional perspective, to maintain and develop the use of the web as a supplement to enhance the experiences of campus based students a number of changes have to take place, for example, increasing investment in infrastructure and staff (e.g. employing experts to support staff, providing lecturers with time, creating promotional opportunities etc.) and also encouraging students to use the WWW efficiently and effectively through, for example, increased training opportunities and improved access. However, while all these factors may encourage increased amounts of use and students may gain more from using the web these are only some of the factors at work. Even if educators try to encourage students to use the web in certain ways, this is not equivalent to the ways student use it. Dealing with accessibility problems is only one factor and should not be thought as a "teething problem" of using technology that, once overcome will lead to high levels of students using the web effectively and demanding more of their degree delivered on-line. Further, institutions would have to consider the extent to which current problems with accessibility (both skills and availability of computers) are transitional and will improve over time or always likely to be prevalent in a proportion of the student cohort.

It seems unlikely that a university would make a significant shift to support using the WWW in teaching and learning in similar ways to the cases here; given the current financial circumstances of the sector and that it is unlikely that this type of use of the WWW would ever lead to efficiency gains that are urgently required. The alternative would be to opt for more student centred, resource based learning, where on-line materials could be used both for campus based and distance learning students, and while upfront investment is required, it is easier to see how this would lead to efficiency gains in the longer term. However, as can be seen above there is no demand from campus-based students for this move (though costs of coming to university may increasingly be a factor).

In the next chapter all of these themes, with regard to the propositions set out in chapter 1, will be considered within the context of each institution and the national context. The chapter will also explore the future adoption of the use of the WWW for teaching and learning in higher education and suggest areas for future research.

9. Discussion

In this chapter the main findings of the study are considered; and comparisons are made between these and the themes apparent in popular discourses about ICTs and the university. In the second part of the chapter, the future of ICTs within higher education is examined, and in the final section the strengths and weaknesses of the study are highlighted.

9.1 Review of the research propositions

In this section, a review of the findings of the fifteen propositions that were used to guide the research are explored. As in previous chapters these propositions have been categorised into one of the four aspects of the communication process: social context, production, content and audience. Each of these areas are considered in turn below.

9.1.1 Social context

Three propositions were developed to consider the social context within which the case studies were placed. These were: *what pressures are universities in England currently facing; how is the nature and role of universities changing in response to these pressures; and in the two universities studied here how are the institutions and departments responding to these changes in role through the support of technological innovation in teaching and learning?*

There are a number of inter-related political, economic, technical and social factors that have consequences for all universities in England. Features apparent in today's society, including globalization and developments in ICTs, are influencing a number of aspects of higher education and have been well documented in the academic literature. As a consequence of such changes higher education institutions must now compete in the new global marketplace for higher education both in terms of programmes offered and research. The competition has arisen not just from other universities, but also from private corporations. Demands from government are one of the most significant pressures on the higher education sector. In recent years the purpose of universities to serve the needs of society, particularly those of an economic nature, has become increasingly significant. A "new bargain" has been set up between higher education and society (Robertson, 1997:75). Policy documents stress the key role universities are to play to ensure the success of the UK in the information society. Further pressures arise, as there is now an obligation for

students to make a contribution to the cost of their university education, thus students now act in some ways as a consumer. Further, these functions must be achieved despite a steady reduction in funding. Indeed, the most recent White Paper acknowledges that the sector is under significant pressure and action needs to be taken for higher education in the UK to maintain its historically high standards (DfES, 2003: para 1.11).

These factors have a number of implications for universities. The demand for a skilled, up-to-date, globally competitive workforce has resulted in a mass higher education system with change in the make up of the student body, encompassing individuals studying at a variety of times throughout their lives for a number of different purposes. Universities now have to cater for this range of different demands; for example, through provision of courses for CPD markets, flexible learning opportunities (Hartley, 1995:153) and changes in the kinds of programmes offered. In order to overcome the difficulties of fulfilling this role, with an associated reduction in funding, large group teaching and less contact time between lecturers and students are increasingly apparent (NCIHE, 1997:para 3.56). Also, PhD students and part time staff carry out more teaching compared to previous times. The need for universities to compete for students and research contracts on a global scale has led to greater collaboration both between different universities and/or private institutions and this move has been encouraged by government policy, apparent in the Dearing Report (1997) and the Future of Higher Education (2003). Collaboration with private companies is also promoted as it is thought to lead to economic benefits, such as attracting business to the local area and enhancing research and development. Indeed, the role of universities in regional development is gaining increasing attention alongside the more national and global focus, for example, placing students with local companies, creating CPD programmes for local managerial needs, and helping to create a culture to attract and retain outside investment (Goddard 1997:2-5). Further, students are now increasingly treated as consumers and thus mechanisms to monitor quality, efficiency and standards in universities are rising as they are viewed as important to protect the student (Skolink, 1998:49-64). While many academics have criticised such initiatives, the autonomy experienced by universities in the past is steadily being eroded. Finally, as noted above, all of these goals have to be achieved in a sector that is experiencing financial difficulties. Often, the use of ICTs is promoted in policy literature as the cost effective tool universities can utilise to

respond to these new demands. Interviewees who had been at both institutions studied in this research for over ten years also identified some of these themes, in particular, the rise in student numbers and the decrease in funding.

From the interviews with staff from across both universities the most frequently discussed change that interviewees had seen while working at that university was the rise in student numbers. Indeed, this trend is apparent across all universities. However, while numbers of students at both institutions have risen, at the time of the research there appeared to be few changes in their characteristics at either university from interview and policy documents. Information about the characteristics of each of the student cohorts in the case study modules is less detailed, yet there are slight differences in the basic characteristics of the student cohorts at Old and New U, in terms of educational background and age. However, these differences were not marked, and, from the data available, the students at New U appeared to be more traditional than the description from policy documents or discussion with interviewees at New U would suggest. However, other information, such as where students live or their class origins were not known in this study. Further, the students reading for a degree in Business and Marketing took the modules in German and Cultural Studies respectively at New U. Thus, these students may not be representative of the general population at New U as more traditional students may take these kinds of courses at a new university, as these institutions often offer more vocational / practical degrees that are less commonly available at the older universities.

Academics have often commented that as a consequence of the rise in student numbers the students entering universities have more demands / educational needs than in previous times. For example, Casey carried out a survey of academic staff between December 1996 and January 1997 for the Dearing report. 1550 individuals were contacted from 31 institutions that were randomly drawn with a probability proportionate to their size (in terms of number of students) resulting in 809 participants. The survey demonstrated that there were concerns from staff regarding the quality of students on the degree programmes at their university. Almost half of the respondents indicated that they believed that the quality of students had declined from 1992-1997. It was not clear if staff were concerned about students from less traditional routes with different kinds of qualifications and / or those who despite

having the same traditional entry route qualifications were not as good as previous years (NCHIE, 1997:para 3.21 or report 3). While a few interviewees at Old U and New U made this point, some disagreed with this view and the majority of interviewees did not raise this issue at all. Changes in the ability of the student cohort may not have been such a major theme in this research because such changes had not been that marked for the individuals interviewed, for example, those in senior management roles and technical support staff who had no / little contact with students. Also, the qualitative data in this study cannot be viewed as representative of the views of the staff at each university. Indeed, a small number of interviewees at Old U did discuss the change in the "markets" of students they were trying to attract (e.g. those wishing to study part time courses and / or vocational courses, CPD and distance learning opportunities).

One trend in higher education that is manifest to all is the steady reduction in funding per student. Consequences of this were apparent throughout many of the themes that were discussed by interviewees. For example, one issue raised by participants from Old U was the problem of increasing staff student ratios. Indeed, as discussed in chapter 5, nationally the staff student ratio has risen from 1:9 in 1980 to 1:17 in 1998 (DfES, 2003a).[57] For New U a further significant change was the transfer from a polytechnic to a university. A small number of interviewees felt that the move from a polytechnic to a new university had made academics more conscious that they were in competition with other older universities. However, for the majority the change from a polytechnic to a new university did not mean a change in philosophy, and the Learning and Teaching Strategy at New U supports this. However, it is possible that there was some increasing emphasis on research prevalent in at least some areas of the university.

From examining the Dearing report and other techno-optimistic accounts of the future of higher education the use of ICTs are typically seen as a solution to many of the problems discussed above (e.g. Gell and Cochrane, 1996). The Dearing report suggests the use of ICTs will: overcome problems of increasing student numbers (e.g. space on campus and staff student ratios), help to enhance quality, increase

[57] Though such statistics should be interpreted with caution due to the changes in definitions over time. Further problems with this statistic arise due to the differences in funding of one international versus one home student. Indeed, funding per average student may be more valuable than this ratio.

competitiveness in new markets, aid research, and lead to more efficient administration.

From the interview data, at Old U the main motivations to use the web in teaching and learning were primarily for distance learning (for use in dual mode packages, CPD and lifelong learning markets) and to a lesser extent enhance campus based learning (through a more student centred approach to learning and help overcome the reduction of funding available to teach increasing numbers of students). At New U the motives were similar, but the emphasis was on enhancing campus based learning as oppose to distance learning (which was a lesser theme). A further motivation was to use the web for flexible delivery of courses. At New U this demand was from undergraduates (a growing number of whom were working and thus taking part time degrees) as well as those on postgraduate or CPD courses. At Old U flexible delivery was a lesser theme and typically associated with CPD and distance learning markets as oppose to undergraduate education. Other motivations at Old U and New U included: lifelong learning, governmental policy and to maintain a reputation as a "good" research university and to continue to attract students; and governmental policy respectively. The disparities in the motivations for using the web reflect the variations in the university's reputation and the kinds of students each university is likely to attract. For example, New U is more likely to attract local students entering university from a non-traditional background demanding a programme which they can fit around other commitments such as work. In contrast, Old U has an international reputation that is more likely to attract students from the global CPD market.

However, the majority of respondents at both universities believed it would cost more to use the web for campus based learning that current costs for traditional teaching. Therefore, financial savings were not considered a strong motive of either institution to use the web for campus-based teaching. Using the web to replace traditional teaching may, in the longer term, bring cost savings, but interviewees stressed that the web was only appropriate for certain aspects of the curriculum, there was student demand for more contact with tutors, not less, and students would experience difficulties with motivation if required to learn at a distance. These issues were also raised by students (see section 9.1.4). Indeed, at New U there was a feeling by some that currently it would be unwise to promote the use of the web as they were

not at the cutting edge of such developments, and it would be best for the university to wait to see what transpired in other institutions.

Thus, there is a relationship between the themes identified from the interview data and national policy documents about the potential reasons universities may begin to increase the use of ICTs within teaching and learning (e.g., to enhance campus-based learning through the use of student-centred approaches to learning and to increase flexibility in delivery). Correspondingly, an extensive study of the use of ICTs in higher and further education identified a number of institutional motivations including: use for distance learning, creation of a market niche to attract students, student-centred learning, and widening participation (HEFCE, 1999:para 1.11). However, confirming findings of this research, a move to more web-based provision was neither believed to lead to decreasing costs for campus-based students nor was it felt that technology could be used for all university teaching and likely to be demanded or even appreciated by all students (HEFCE, 1999:para 1.12).

As detailed in chapter 5, both Old U and New U had a devolved structure, with a great deal of financial and managerial responsibility being left to the schools or faculties respectively. This type of structure had implications if the university as a whole wished to increase the use of the web in teaching and learning as each faculty would have their own policies and strategies. Despite both universities having a devolved structure, there appeared to be more of a move towards the use of the web at a university-wide level at Old U compared to New U. This was apparent in the number and presence of the central initiatives. For example, though both universities had a central unit that co-ordinated, supported and funded projects, Old U had adopted and supported a particular MLE across the university and had a number of technically trained staff that ran central training courses and one-to-one advice across the university. At New U, all help was provided through the unit (which comprised of two individuals) with no central technical support. Further, a more central push in the use of the web in teaching and learning was apparent in Old U policy documents. This may be because at Old U the goals of each school within the university were similar (i.e. to have an excellent reputation, particularly for research). In contrast, the faculties at New U may have different objectives and definitions of success (although the quality of teaching is evaluated centrally it is the quality, not delivery method,

that is considered important), thus it was not necessarily appropriate to have a university-wide strategy.

In chapter 5, a range of initiatives were identified in each university that may help to encourage the adoption of the use of the WWW in teaching and learning, for example, central projects, teaching fellowships at New U, and workshops. These initiatives may contribute towards adoption of new technologies, but their influence is neither direct nor necessarily positive. Central policies will have different effects in the various faculties, schools, departments and on individuals. Factors, such as appropriateness, how much staff are rewarded / encouraged to use new technologies, availability of extra support staff, and the quality of the technical infrastructure for staff and students may all differ at school / departmental level (this issue is discussed further in section 9.1.2). Indeed, as detailed in chapter 8, the six cases here did differ in these aspects. For example, at Old U Dentistry had the most support and English the least and this may be due to the difference in departmental cultures, the beliefs concerning where technology can be used appropriately, student expectations and the availability of associated CPD markets. From the interviews with the innovators in each university, the majority felt that the current level of institutional support was not sufficient for staff to increase the use of the WWW in their teaching and did not feel any of the initiatives highlighted in chapter 5 would lead to a significant and lasting impact on the way the majority of teaching and learning on campus was carried out. A great deal of the literature that explores the likelihood of success of using new technologies emphasises the importance of institutional support for the academic to develop materials for the WWW (see e.g. Taylor, 1998:275-277), yet there are other important considerations, and these are discussed in the section below.

9.1.2 Production

Five propositions were used to explore how and why websites were or were not being produced for teaching and learning in the two universities. They were: *what are the main motivations and/or incentives for academics to use the web in teaching and learning; what are the main barriers university staff face when trying to use the web in teaching and learning; what are the main motivations and/or incentives for innovators to use the web in teaching and learning; what are the main difficulties innovators face when trying to use the web in teaching and learning; and why did the case study lecturer use the web for the module of interest?*

As outlined in section 9.1.1, there are few institutional incentives for academics to use the web in teaching and learning. In the main motivations are primarily personal, such as enjoyment and interest in using technology. Interviewees from across each university were asked what they thought were the main reasons preventing academics from beginning to use the WWW in their teaching. The two main issues were time and role change. The issue of time was often discussed in the context of staff that were already overworked and simply had no "space" to take on additional work. The second important theme, particularly at New U, was the potential changes in role that using the web in teaching may bring. This was partly because a professional's identity was felt to be wrapped up with lecturing and also because of the fear that using technology often meant a loss of control over the learning situation (due to its suitability for student centred approaches). It was also felt that academic staff were resistant to change (particular more senior members of staff). Indeed, Nedwek (1999) suggests that the academic role is likely to change from one which provides knowledge (i.e. a more didactic approach) to a more student-centred and facilitative approach. Further, it is predicted that the teaching and the development of courses will be developed using a team of experts, of which the traditional academic is just one (Nedwek, 1999:178).

Indeed, associated with the changing university system is the changing role of the academic (Rowland, 1998:133). In the UK, the role of academics has changed due to a number of interrelated factors including technology. For example, the move from an elite to a mass higher education system; more flexible ways of working commonly associated with the majority of jobs in the 21st century; increased accountability for academics (Blaxter et al., 1998:281-283); the associated focus on outputs (i.e. in research and teaching) in universities to determine funding; as well as the rapid increase in the availability and use of new technologies (Porter, 1999:219). These changes have led to academics having far less autonomy; less secure employment; and less promotion chances than in previous times (Halsey 1992 cited in Johnson 1994:372).

Interestingly, role change was perceived as a more important factor at New U than Old U and technical support at New U was seen as far less of a problem than at Old U. This may reflect the influence of the central unit at New U, and other initiatives around the university (e.g. the introduction of teaching fellowships, and promotion of

the CertEd) to move towards innovative teaching methods that typically involved a more student centred approach. Also, teaching may be more central to the identity of staff and central technical support was simply not available and therefore not seen as an option at New U. Other themes raised at both universities included: lack of technical skills, course constraints (i.e. length of time to gain approval for changes in assessment or changing timetabling to suit delivery of some teaching via computers) and lesser themes such as: a lack of evidence of efficacy, the threat of having material on public view, and an inadequate technical infrastructure.

All the innovators who were interviewed were asked what their main motivations were for using the WWW in their teaching. The large majority of responses in both universities related to teaching and learning issues, such as trying to augment existing teaching, promoting independent learning, providing extra resources to enhance learning, and improving the learning experience for increasing student numbers. A small minority of respondents felt that the use of the web had helped save time (e.g. with course organisation and photocopying). The other main theme that was discussed in the interviews related to the personal rewards people received for using the technology. In the old university respondents often cited a particular interest in using the technology as a motivation and respondents from the new university discussed their interest in teaching issues, often prompted by a Cert Ed or other course. Some institutional rewards, such as the occasional additional teaching and learning responsibility or post and funding available for central projects were mentioned. However, it was clear that these institutional factors were not of great importance in motivating these members of staff at either institution. Institutional rewards were modest and, in consequence, of little significance in motivating staff to adopt ICTs. Whether more substantial resources would stimulate more innovation for staff remains an open question.

Similarly, in all six cases the WWW was primarily used with the intention of improving the educational experience for students. Each case encompassed a combination of supplementary resources and / or a discussion board, yet the intended purpose of the websites varied. To an extent all the lecturers endeavoured to encourage a greater amount of independent learning through the provision of web-based resources and a smaller number tried to promote collaborative learning skills.

Other motives in the cases at Old U were enjoyment and interest in using the technology and the cases at New U an interest in teaching more innovatively. Only one innovator (at New U) was employed to spend half her time developing the use of ICTs in teaching and learning within her division. Other motives that could be identified in one of the case study modules were: to develop a school wide reputation in this area; to overcome a lack of library resources, lead to greater efficiency for the students, and save the lecturer time; and to overcame a reduction in face-to-face contact, though this time was merely transferred to on-line teaching and there was no real reduction in staff time. These are similar to some of the themes found in the policy literature on this topic, i.e., improving school reputation and thus enhancing competitiveness, assisting with lack of resources, time constraints and to overcome a reduction in contact hours. The success of such aims differed, and these were lesser themes than the primary motive to provide some form of educational benefit for the students.

Similar to the barriers encountered by academic staff that had not yet used the WWW for teaching and learning, the main difficulty innovators encountered was a shortage of time at both Old U and New U. Indeed, while a small number of innovators felt that using the web had helped them to save time the majority felt it had been far more time consuming (especially when used as a supplement to existing teaching methods). In all cases very little, or no reduction, was made to lecturer's existing workloads. This is contradictory to the policy document literature that view the web as a tool that saves academics time, to overcome problems such as increasing numbers of students. Typically, it is predicted that after initial input into a course, academic time will be freed up (especially from mundane or administrative tasks). This time can then be used to focus on smaller group teaching and research. It seems this would be the case only where the web is used as a replacement to face-to-face teaching; this has not been the situation here. As noted above, innovators in both universities also had some problems with technical infrastructure. At Old U innovators identified two other difficulties as being the lack of synergy between departments involved in the MLE, such as student records systems and other central information services, and a lack of recognition of teaching within the institution. These two factors were not identified in the new university. At present the new university does not have an approved MLE. The second issue regarding recognition of teaching is perhaps not as apparent in the new university as there a lecturer's role

is likely to be more focused on teaching than on research. The value of research over teaching is recognised in recent policy documents (DfES, 2003:para 1.18) and proposals have been put forward to rectify this, for example, through encouraging promotion strategies for good teachers by rewarding institutions who build this into their human resource documents, creation of centres of excellence in teaching, and the development of National Teaching Fellowships. Plans for students to have more information about the quality of courses may provide further incentives for universities to value teaching.

Thus, there are some similarities between the barriers preventing more academics adopting the web and the experiences of innovators. While there are problems with the research,[58] it does provide insight into the difficulties staff at the two institutions are facing when using the WWW for teaching. Resolving (through significant investment and planning) many of the more practical issues, such as technical infrastructure, the freeing up of staff time, and changes in the universities policies on course delivery and promotion criteria may all help to encourage more staff to use the web for teaching and learning and ease the path for innovators. Indeed, in research that focuses on the adoption of new technology issues such as incentives for staff, training and financial investment are highlighted (e.g. Taylor, 1998, Ryan at al., 2000). There has also been a significant growth in literature that explores how change can be implemented within a university and how the organisational culture(s) may influence the success or failure of the change strategy selected (Thomas and Willcoxson, 1998). Yet care must be taken that lack of use is not simply interpreted as a lack of time, training and other practical factors that can be solved through investment. Since academics do use other technologies where they perceive them to be appropriate, though they remain pressured, it is unwise to conclude that non-use is simply down to such issues, as there may be other good reasons (Crook, 2002:298) for example, role changes, lack of student demand, and inappropriateness of subject matter.

[58] That is, the responses of interviewees cannot be considered as representative of either institution, and those who are not interested in increasing the use of the web in their teaching and learning were not included in the study.

9.1.3 Content

Three propositions were used to guide the research about the content of each of the case study modules and factors (in addition to those discussed in sections 9.1.1 and 9.1.2) that may influence both the intended purpose of each website, the design of the site, and potential consequences of that design for students' use (some of these issues also overlap with section 9.1.4). Here the propositions are: *how were the case study sites produced; what educational purpose(s) are the case study sites designed to fulfil; and how are the sites presented and how does this influence usability?*

Throughout interviews with all innovators, across both universities, it was clear that they did themselves a large proportion of the work involved in developing the use of ICTs in their courses with occasional support / help from technical staff. Again, in the case study modules of interest four of the websites were designed and developed personally by the case study lecturers. In only one case (at Old U) did the lecturer work with a web designer, who in this case was also a subject expert who developed the site, which once completed, was then updated by the lecturer. The final case (at New U) did not have a website though the central unit assisted the lecturer in setting up the web-based discussion boards. It is evident that innovators must be prepared to undertake the lion's share of development and maintenance work themselves.

As discussed fully in chapter 8, the provision of a comprehensive set of resources, including a discussion / bulletin board, had different central purposes. From analysis of the case study websites, examination of course documents and interviews with the lectures the following purposes were identified.[59] In case 1 (Law) it was to enhance interest and increase motivation through convenient access to resources and the opportunity to share and discuss experiences; in case 2 (Dentistry), to ensure consistency and availability of information / resources; in case 3 (English), to provide an organisational function, save students time, to overcome a lack of university resources, and to provide a forum for further discussion. At New U, the use of web-based resources tended to be less of a focus, with a greater stress on the use of on-line discussions compared to the modules at Old U. Similar to Old U, each case had slightly different functions, in case 4 (Midwifery), to link theory and clinical practice, provide support, consistency of information and learning

[59] Though it is important to note bias may have occurred as the same researcher carried out each method. Thus analysis of the case study site may well be influenced by prior discussions with the lecturer and / or reading course documents.

experience, and enhance collaborative learning and lifelong learning skills and in case 5 (German), to overcome a reduction in contact hours and improve written and other communication skills. Finally, in case 6 (Cultural Studies) the web was used as a form of module organisation, to encourage reading, to enhance discussion of difficult topics, and to improve communication skills. There are some similarities between cases at Old U and New U, notably the importance of providing consistency of information in cases where students may encounter different clinical experiences, and to provide a way to organise the module in cases where the face-to-face teaching is seminar based and prior reading / preparation by the students is of particular importance. Typically the web was used as a supplement to the existing course. In only one case, case 6, was the web used as a partial replacement of some of the face-to-face teaching in the latter half of the semester. Thus, the use of the WWW in each of these cases does not signal a break with what has gone before; the use of the technology has not resulted in a significant difference in the way the subjects are taught.

From analysis of each of the case study websites, the usability of each site, encompassing navigation, presentation and structure was, overall, good. There was a clear relationship between proposed usability good practice guidelines (see section 11.1 in the appendix) and students' opinion of the site as determined through both qualitative and quantitative data in each case. In this study, usability was unlikely to negatively affect the students' use of each of the case study sites and may enhance it, although this cannot be deduced from analysis of the data available. Thus all six lecturers to a great extent followed good practice guidelines for usability though, interestingly, none of the lecturers discussed consciously using such guidelines. Only one lecturer at New U had any training in the area, yet all succeeded. The limited and varied amount of help available, e.g., the use of the university MLE or forty-five minutes of training, appears to be sufficient in these cases. This is perhaps due to the lecturers' prior experience of using ICTs in teaching and learning (with the exception of case 4, Midwifery) and / or extensive use of the medium within their daily lives.

Thus, as observed above, innovators here do most of the work and have trained themselves (for the most part) in the skills required to develop appropriate websites for their students. These innovators have used the web to enhance and supplement existing teaching methods in ways that are suitable for their courses and this has not

led to dramatic changes in the way the module were conceived and delivered. It seems that the original intentions of the lecturers were well reflected in the content and design of the websites in each case.[60] This section supports the findings discussed in part 9.1.2: that there is little institutional support for such initiatives and while these innovators can achieve their aims with little practical help from the university, it is unlikely that the majority of staff would adopt such initiatives without sufficient motives and practical support to do so. How students used the site is clearly important and is discussed below.

9.1.4 Audience

There were four propositions that helped to guide the research to gain an understanding of the audience, i.e. the students: *how do students use the website; why do students use the website in this way; are social relationships (with other students/lecturers) altered by using the web in teaching and learning and if so, how; and what are students' opinions on using the web for greater amounts of teaching and learning, and / or replacing more "traditional teaching"?*

In all cases, students did not report spending a great deal of time on-line for the case study modules. The differences in time spent on-line between cases related to the extent to which students were required to use the web and if it replaced any face-to-face teaching, though level of use was likely to be influenced by a range of factors. The small amount of on-line use did not relate directly to students having a poor opinion of the use of the web in each module. Further, the figures do not provide an estimate of how much related off-line activity takes place or how these figures related to the extent to which students use other sources of information, such as books or friends. Indeed, from the qualitative data many students reported printing off relevant material to use at a later date and / or preparing contributions to the discussion board off-line. The study could have been improved through a greater understanding of how the web is integrated within the degree programme and this will be discussed further in section 9.3.

[60] However, as in no case was the production process followed from inception to final production of the website, there may have been various small factors (not recalled by the lecturer) that affected the design of the site, for example, limits of the programme they were using or limits in their abilities. Also, as noted above, bias may have occurred as the researcher examined the websites and interviewed the producers of the case study sites.

In general, students used the parts of the website that they perceived to be most useful to them or because they were assessed. The least used parts of the site were those features that were classified as module information. This is to be expected, particularly as students typically received this information on paper and the case study lecturers did not, in general, consider these sections a key reason for creating the site. Parts of each case study site categorised as text-based resources were used more often by the students, although use would typically depend on the perceived value of the resource and if they already had the information on paper. Interactive tools were most frequently used by the students and often perceived as the most valuable features of the site. Students' use would vary according to factors such as assessment and time.

The fit between students' use and that intended by the lecturer differed in every case. There appeared to be a strong similarity between the intentions of the case study lecturer and analysis of the content on the case study site.[61] From the qualitative data, the provision of certain features by the lecturer did not always lead to students using the site in the ways intended by the lecturer, and in general students had to perceive a value before using the site in that way. Student use in these cases is very complex, and a variety of interrelating factors were identified that had a role in influencing the amount students used the websites and the particular features they use the most / least. Further, the significance of these and other factors varied depending on the individual, the specific social context and the individuals' perception of that context.

One of the most consequential issues influencing students' use was time. Unsurprisingly, students prioritised their work in terms of the time they had available. Here, there were a variety of competing pressures, for instance, workload across the degree programme, social life and assessed work particular to the module. The significance and weighting of these pressures influencing students' use varied, though there were some similarities between subjects and year groups. For example, cases that involved clinical placements had the least amount of free time (i.e. time that was not timetabled), and the cases that involved first year undergraduates highlighted their social life as particularly important. In all cases, assessment was an important factor and was typically a central motive for students to use the web

[61] Though, again, bias may have occurred as one researcher both analysed the websites and interviewed the case study lecturers.

though students often perceived there to be educational benefits of these features. This is unsurprising, as the lecturer will assess the features that are considered to be of particular value to the students. Students would use a feature of a site if they perceived it to have a direct learning benefit regardless of whether it was assessed or not. Therefore students are calculative and instrumental with regard to their use of web-based resources; they assess the direct benefits of use and act accordingly. In this case, assessment is a major reason for students to commit time to web-based materials.

Usability and access are two more factors that were explored as part of this study that may influence students' use of the websites. Usability of each of the case study sites was good and thus unlikely to influence students' use (see section 9.1.3). Access was split into two areas: skills to use the Internet and access to computers. From students self report data, the majority of students were regular users of the Internet and frequency of access did not differ greatly for the majority of students at Old U and New U. Further, the majority did not feel they required more training to help them use the case study websites, although few had had any formal training. However, in all except one case there were a significant minority of students who would have liked more training. Students who perceive themselves to have limited skills may be put off using the technology at the start of the module and feel they are missing out, or unlikely to benefit. While training was available in all cases, support varied, and for those students who needed help a more systematic training opportunity could be helpful. Indeed, support for students to improve their IT skills to an adequate level is often recommended when considering increasing the use of the web in teaching (e.g. Ryan et al., 2000:162).

Students at New U report better term time access and this may be because a greater proportion of New U students were more likely to live at home whereas students studying at Old U are likely to live in rented accommodation (though this cannot be determined from the data collected). Nevertheless, access to computers was only reported to be a significant problem in one case at New U, where students were supposed to access the Internet from their clinical placements. However, despite a sizable minority in four of the remaining five cases also reporting problems; access at both universities appears to be acceptable, although ease of access depended on students using the facilities at unpopular and inconvenient times. Difficulties,

whether due to access or limited IT skills, can influence the educational benefits of the course. Hara and Kling (1999) conducted a small-scale qualitative study of distance learning students using a web-based course. They found that students were frustrated by three factors, one of which was technical difficulty, and that these factors then had an impact on the educational outcomes (p.1).

As with academics' adoption of the use of ICTs in teaching and learning, provision of better access and improving training opportunities neither directly nor necessarily link to increased amounts of students' use, nor do they lead to higher evaluations of the website. However, increasing the ease with which students can access the site and improving their skills in this area may encourage students to see the web as an efficient and effective medium to use for learning at university, as students will optimise their time. This is supported in other literature. Individuals will only use new technologies when they see them as valuable, fulfilling a useful function or purpose (Morrison and Svennevig, 2001:129-141). Individuals are active and will use technologies according to its significance and purpose within their life, if the technology does not enhance an aspect of life or have a specific use then the technology will not be used (Selwyn, 2003:110).

The majority of students in each case did not think the web had a negative effect on their relationships with other students even where the web had been used in order to overcome reduced contact hours or as a partial replacement to face to face seminars though this may be because of the seminar-based format (both on and off-line) of these modules. However, despite the use of a discussion board in four cases for students to share and learn about theirs and others' opinions or experiences students did not think the web had enhanced the relationships between students. Typically, students saw no need for the website to fulfil this purpose, and it was not a central aim of the website as designed by the lecturer. Often students did not connect the on-line discussions with face-to-face situations.

Similarly, from the student perspective, the use of the web neither had a negative or positive effect of the student – lecturer relationship. The web seemed to be a reflection / reinforcement of the kind of lecturer students already perceived the case study tutors to be. In each case students often noted how good the case study lecturers were and the web just seemed to be part of this overall view. However, in

each case there were a minority of students who felt the web had a negative influence on relationships between students and between staff and students.

Despite some demand from students for the WWW to be used as a supplement there was an overwhelming lack of demand in all six cases for the web to be used as a replacement to existing face-to-face teaching methods. There were a number of reasons for this which echo themes identified from interviews with staff (see section 9.1.2). For example, students felt they learned better in social situations and preferred face-to-face contact, they stressed the importance of the social aspects of coming to university, they believed they did not possess the skills for on-line learning (e.g. time management) and found it hard to do the work without the motivation arising from the routine of attending lectures and seminars. These themes are highlighted in other literature on this topic. For example, the importance of timetabled activities for students (e.g. Crook and Light, 2002:174) and the difficulties students face when expected to engage in the more student-centred approaches to learning which are often required when using the web (e.g. Clouder, 1998:189). Lesser themes identified from interviews and focus groups with students were: insufficient university infrastructure and staff who lacked the skills required for on-line learning to be successful.

Although the lack of demand for the web to become a replacement to existing teaching methods was apparent in all cases, a few students could see the benefit of the flexibility the form of learning could offer and the potential that this method of learning may have to overcome some of the cost implications that now had to be considered when entering university. Despite these potential benefits, students did not want their teaching replaced by on-line methods. This demand for face-to-face education is often highlighted in the literature (e.g. Noble, 1998:366). However, students' preferences are likely to differ according to the individuals' circumstances and the kinds of programmes they demand. For example, part-time mature students might be more likely to demand web-based delivery compared to full time "traditional" students.

9.2 *The future use of ICTs in teaching and learning in higher education*

Typically technology features heavily in debates about the future of higher education. For some ICTs will be the solution for a sector on the brink of crisis, while for others it will destroy the university as we know it. Government policy documents can be placed in the techno optimistic camp, with ICTs solving a range of problems, enabling universities to serve the needs of the information society. If we are to believe the hype ICTs are panacea for higher education. Yet, the research here does not appear to fit with this story. The two universities, like many across the country, are changing in nature and role; serving the needs of the society though provision of a mass education system geared increasingly towards the needs of the workforce, competing on a global and local level for students and research contracts, promoting innovation and research within the UK economy, and striving towards these and many other goals within a sector currently experiencing a steady but unrelenting reduction in funding. Universities are facing many difficulties that, according to technical deterministic viewpoints, could be resolved through the efficacious use of technology. Thus far, however, the extent to which ICTs are being used as a "solution" seems currently to be far less significant that the dominant discourses suggest.

While the huge presence of ICTs in higher education cannot be denied, it was clear from discussion with participants at both universities and from examination of the case study modules that currently, the WWW is not leading to a radical transformation in teaching and learning in the two universities here. In no case did the use of the web fundamentally change the way a module was taught. In the main, the existing teaching structures remained in place, with the web being used as a supplementary resource. In only one case was some of the face-to-face teaching replaced by on-line methods. Further, a lot of what students could do via the web, such as locate and use resources and take part in discussions was similar to tasks that students in an entirely face-to-face course would carry out. In addition, the web did not significantly alter relationships between staff and students. Similarly, interviewees from across both universities saw that while the use of the web could, in the future, be used to increasingly enhance campus based teaching and learning they did not think this would lead to significant changes in the teaching and learning process at either university. These findings are not peculiar to the two institutions

studied here. Few institutional learning and teaching strategies contain a significant commitment to the use of ICTs as an institutional strategy (HEFCE, 1999:para 1.9). Further, in HEFCE's report, the majority of staff in universities have not adopted the use of ICTs in teaching and learning, with most innovations carried out in small pockets around the institution. As the report states,

> On the basis of the activity reviewed, the more exaggerated claims of some of the advocates of the use of C and IT in teaching and learning have not been validated, and the use of C and IT in teaching does not yet occupy a central role within either HE or FE. This is not to say that the many activities currently being undertaken will not make a significant change to the way teaching takes place, simply that there is a long way to go before the institutional reality about the use of C and IT matches some of the rhetoric.
>
> (HEFCE, 1999: para1.8)

Despite the fact that ICTs are not being used extensively, nor having the dramatic effects often highlighted in popular discourses on this topic the WWW was being used in some of the ways suggested in policy documents. For example in the six case study modules the web was primarily used to enhance campus based teaching, and from interviews across each university it was clear that many felt the web could be useful in particular courses to increase flexibility of delivery and for distance learning markets. Yet, in neither institution was the web being used in a significant way for campus based teaching and learning. This was due to a number of factors: the costs involved for campus based teaching, the inappropriateness of the web for all subject matter, the potential reduction in contact if the web was used for increased amount of teaching and learning which was not demanded by the students and more practical factors, such as lack of time or staff with relevant expertise.

Without significant changes to the way modules are organised and delivered within universities the use of the WWW and other new technologies in teaching and learning will never be adopted as part of the mainstream teaching at a university, and typically lead to increases in costs (Bates, 1999:207). Suggestions about how to increase the adoption of the use of ICTs in teaching and learning in a cost effective way necessarily implies a radical rethink of the nature of campus based education. Certainly, if the culture and the existing teaching structures remain in place, this will not lead to cost savings for the sector for campus based education, yet from discussions with both staff and students at these two institutions it is apparent that a move towards a more resource based approach to learning with less face-to-face

contact is not desired by the students studied here. Indeed, the Dearing report did note that contact between staff and students was highly valued, but argued that ICTs offered access to resources and forms of contact not currently available to many students (NCIHE, 1997:para 8.21). Certainly, a more resource-based approach to learning may offer some students a more positive educational experience; yet the appropriateness of this form of teaching and learning will vary according to social contexts and the motivations of the staff and students involved.

In the dominant discourses on this topic, the concerns raised by academics here are viewed as short-term barriers to be overcome, that ICTs will be beneficial in all circumstances. Overcoming practical problems for both staff and students, e.g., quality of technical infrastructure, lack of support and technical skills and other factors for staff such as promotion and institutional policies, may be achieved with considerable investment in time and resources and may well encourage further adoption of the use of the web in teaching and learning in the university. However, for some commentators once these barriers have been overcome there will be no resistance to increasing the use of the web, as it will bring "obvious" teaching and learning benefits. What is important, that in addition to these "teething problems" is consideration of the fact that the use of the web may not in fact be the straightforward solution to the universities' problems and for those within the institution may not adopt for a variety of rational reasons. Indeed, those who work within the contexts in which the WWW may be part are well placed to make such decisions.

Though the Dearing report does note that the major changes required are cultural and will entail more than efficient investment (NCIHE, 1997:para 13.57) it is striking, when reading through the Green and White Papers about higher education over the past five years, that despite the lack of a strong evidence base and the relatively small number of innovations in this area, the belief in ICTs as panacea remains. It may well be that the professionals currently working in the field are not as confident that ICT is the "solution." Non-use (both by staff and students) may well be a very reasonable path to take. The use of ICT will be structured according the context within which the individual is placed, and this context is made up of a range of cultural and more tangible factors. As Selwyn notes, "each individual will be constantly negotiating the "proper placement of technology" into their lives according to a range of personal

and institutional factors" (Selwyn 2003:110) and that use or non-use of technologies can vary throughout life (Selwyn 2003:113). Thus, as is clear from this research students and staff will adopt the WWW in teaching in learning in ways that are appropriate to them, given their individual motivations and their perception of the context in which such work takes place. In the future, if initiatives and funding push institutions down a more technology-led route academics may well have to use such mediums, though still the different departmental cultures will inflect any university wide policy. It is a concern that if academics are pushed to use technology, then it is likely to be used in inappropriate ways, for example, simply posting up lecture summaries students already have onto the web in order to fulfil the institutional policy. Individual needs and motives and the context of learning are likely to differ for various universities, departments, programmes and students and the intended and actual use of the WWW within those circumstances will vary.

This study has focussed on the short to medium term of the possibilities of the use of the web in higher education. While it is difficult to predict the future, it is likely that the web will be used in various ways for different kinds of institutions and programmes. For example, in the American system mass, elite and universal forms of education are apparent. Though the distinctions are not clear-cut, a university may well engage in delivery of a variety of programmes that may be classified into one of these areas. If one assumes that the main features of ICTs are enrichment, access and cost, it is likely that the use of ICTs in each of these three main types of education will vary as will the way they are supported / promoted by the institution. For example, new technologies are likely to be used to enrich elite higher education, as cost savings and flexibility are not as important to these institutions or the student intake. In contrast, flexible learning is of more importance in universal education whereas in mass education ICTs are likely to be used to enrich but cost considerations are more of a focus (Trow, 1997). The ways ICTs will be supported in institutions is likely to vary according to factors such as mission, culture size, and management priorities (HEFCE, 1999: para 6.5–6.14). In addition, policymaking is not straightforward or direct and departmental cultures as well as institutional cultures are very important. Differentiation in the university sector is currently a key topic in higher education, for example the reallocation of research funding (see, NCIHE, 1997: para 1.6, 1.7, 1.8, and 11.67; DfES, 2003: para 1.39 and Universities UK preliminary response to the White Paper published in 2003). Further, while the

students in this research did not demand more web-based learning, some students who would prefer a campus based experience may not be able to participate as cost considerations are likely to become increasingly important and thereby drive them towards alternative, perhaps web-based, experiences.

The future of universities is likely to be shaped by a range of factors and the use of technology is just one. The use of web has not radically transformed teaching and learning in the cases here, what has happened is more in-line with what Morrison and Svennevig (2001) term "functional amplifications." The use of the WWW in the cases of interest here may be altering the university experience in some ways, but it is not causing a transformation of the whole process of teaching and learning. What is clear is that universities now have to make strategic decisions that may or may not encompass the use of new technologies, in order to provide the best opportunities for higher education in the UK. Though authors differ in their viewpoints on the future of higher education, many agree that universities must make a conscious decision to direct the future path of the university, as not to do so could have many negative consequences (e.g. Laurillard, 2000:153). As Pollock and Cornford (2003) state, "the choice facing universities turns on which aspects of the traditional institution they wish to PRESERVE, and which of the promises of new technology they should begin to acquire" (p.372).

9.3 *What has this research achieved?*

The cases explored here provide a different picture to that painted by the dominant discourses about ICTs and higher education. The use of the web in teaching and learning is not radically transforming either university, nor is it providing a blanket solution to the problems the sector currently encounters, nor is it regarded as such. Yet, the technology is, in places, adding to the experiences of staff and students in a variety of different and complex ways - both positive and negative. Through exploring practical instances of educational innovation this research has indicated the mesh of interrelating factors that are at work when using the web in teaching and learning, and the importance of considering the experiences of the individuals directly involved, the variety of ways the web can be used in university education and the influence of a range of social contexts. The complexities apparent in the cases here are too often ignored in the hype that often accompanies debate in this area.

As stated in the introduction, there is a real need for work of this kind to provide a greater insight into what is actually happening in the field as opposed to the broad-brush statements often found in technological deterministic writings about this topic (Selwyn, 2003:182). This study has gone some way to achieving this goal, though as with all research (perhaps particularly that of an exploratory nature) improvements could be made. From the research here, each university was experiencing similar changes to those at most universities in the UK. Further, similar themes were identified at each university as well as at the module level. Arguably, these two factors contribute to the strength of the findings; however the case study approach employed here has a low level of external validity, as it is difficult to generalize the conclusions reached. The research can neither make claims to statistical or analytical generalizations (Yin, 1989:38) but nor did it seek to as, at present, research in this area is patchy and concepts are in their infancy. Indeed, from a qualitative viewpoint the concept of generalizability is not appropriate; instead, one should consider the extent to which the findings are transferable to other situations. This is dependent on the detail provided in the original research that can then be used by the reader to translate the findings for use in their own circumstances (Trochim, 2000). Throughout the research, consideration was paid where appropriate (depending on the kinds of methods and data) to the various forms of validity, reliability, plausibility and credibility. Thus it is hoped that the concepts that can be developed from the findings of this exploratory study can be investigated in future research whilst being of immediate use to those interested in this topic who wish to interpret the findings of the cases here for their own work.

A clear strength of this study was the use of a communications model to organise, conduct and analyse the research as this enables one study to explore the key features central to exploring the use of technology in teaching and learning.

One interesting finding is that, as is discussed in chapter 8, students' use fitted well with the Uses and Gratifications model in communication research, where the audience is viewed as active and their media use depends on their motivations for engaging with the media, the needs they seek to fulfil and the satisfaction they will gain from use (McQuail, 2000:387). Though there are difficulties with such an approach, for example, reliance on self report data, the lack of predictive power, and the prioritisation of individual needs and neglect of the actual content (Hanes,

2000:3). What is key, is that Uses and Gratifications research arose from a response to effects theories research, where the media were seen as having a direct impact on the audience who were seen as passive recipients of the media content. It demonstrated the audience may have a variety of different needs and motives for using the media and was also useful when exploring the different influences the media were likely to have (Severin and Tankard 1988:303). Similarly here, the sweeping general statements, positive or negative, about the impacts technology will have upon students, are not as direct, quick or dramatic as one is typically led to believe, since they depend on a range of interrelated issues and influence is likely to differ according to the individual and the context within which the individual is placed. Indeed when reviewing the history of communication studies the cyclical nature of the research in this field is apparent (Curran, 2002:112).

It is acknowledged that the findings from communication studies in the use of television, radio and other media forms can only go some way to assisting with the understanding of how the web is being used in teaching and learning in higher education. Indeed, using a communications perspective is just one of an array of approaches to explore technology and social life. Yet, the use of the communications framework used here and the ideas from previous communication models may well assist future studies. Crudely, different approaches to studying communication all consider the four main aspects of the communication process: producer, content, audience and social context, and typically focus on one aspect with some consideration of the other three. The lesser attention paid to these other three features often forms the basis of the criticisms against each approach. As Stevenson (2002) notes,

> Whereas postmodern responses are inadequately concerned with the role of powerful media institutions and social questions, Marxist arguments overstate the determining power of the economy, and audience studies often fail to take account of wider social relations.
>
> (p.196)

Here, one approach is not promoted over another, as the research was not designed for this purpose. However, the value of such a model is stressed, as it can allow scholars to consider all aspects of the communication process and decide in the context in which it is used the significance and interrelationship between these areas.

The model is also useful as it is quite general and can therefore be used for a variety of different contexts (e.g. other organisations or other universities). Further, it can be used for different mediums or a different application of the same medium. For example, when the web is used for educational purposes it can be used in a didactic way to transmit information between lecturers to students, or be used to enhance collaborative learning amongst students. Also, while this research is primarily qualitative, in future studies a communications framework that links together more macro issues (such as context) and micro issues (such as student use) may overcome some of the difficulties of the barriers between the two "warring" paradigms. This may further increase the use of mixed model studies. It has been suggested that a particular strength of a multi-method approach is the choice of methods to explore both structural process and social structures (Kelle, 2001:para 37). Indeed, Layder (1993) argues that often the division between quantitative and qualitative approaches parallels the macro – micro division in research. He argues that researchers should employ multi strategy approaches to data collection of both qualitative and quantitative methods to help overcome divide of macro/micro issues. Further, the two approaches can be used at both levels as long as it can be justified within the research (Layder, 1993:109-115).

The model also aids identification of areas for further study or weaknesses in the current research. Proposed improvements to this study are made for the research instruments / schedules used and the methodology employed. Specific problems with each method are highlighted where appropriate throughout chapters 3-7 and will not be reviewed here - though were considered throughout the analysis and reporting of the findings. Below the more significant changes that would improve this research, if replicated / developed in the future are highlighted.

From the author's perspective, the most significant problem with this research is the absence of a greater insight into the whole undergraduate experience of learning at university, of which the web was just one part. In general, the methods here focused on those that were considered most useful for evaluating the more formal parts of the learning process. Though some understanding was obtained through interviews and focus groups with students the study could have been improved through further consideration of how the use of the web in the module fitted into students' existing experiences of university and how they perceived the role of the medium within their

studies. There has been a lack of research that focuses on the diversity of students' experiences of higher education. Typically research that explores an aspect of student learning at university has a very narrow focus, and is often conducted via a questionnaire or interview, with a neglect of the wider issues associated with student experience (Murphy and Scott, 2003:1). One exception is the work of Crook and Light who have employed a range of methods including student diaries, focus groups with students, a student survey and observation to explore the wider student experience of which information technology was just part at two universities. As Crook and Light (1999) note:

> The established culture of learning can greatly influence the prospects for new CMC initiatives. Existing institutional practices can equip students with particular experiences of their relationship to both their disciplines and their peers and these experiences will dictate the way in which new technology is appropriated – or indeed, whether it is appropriated at all.
>
> (p.191)

Indeed, the importance of considering the cultures into which ICTs are introduced was stressed in the introduction, but the overall student experience was not considered in enough detail in this study. A principal reason for this error arose as a consequence of the practical difficulties of studying technology and society, combined with a slight shift in perspective over the three years. That is, a shift from students' use of technology as a primary focus of the study towards an increasing interest in how the use of the WWW integrated within the whole student experience. It is perhaps easier to critique technological determinism in theory, but when exploring technology and social life in real life situations it is very difficult not to stress the technological and to an extent set it apart from the social. This may be particularly the case when the lecturer has introduced the web into an existing module with the aim that it will lead to some positive outcomes. As Law and Bijiker (1992) point out,

> Technology is never purely technological: it is also social. The social is never purely social: it is also technological. This is something easy to say but difficult to work with. So much of our language and so many of our practices reflect a determined, culturally ingrained propensity to treat the two as if they were quite separate from one another.
>
> (p.306)

A greater insight into the social context would have also been provided through the study of students who did not use the web for the case study module, as the

qualitative research in this study tended only to focus on those who did use the case study sites.[62] Indeed consideration of lecturers who chose not to develop such initiatives from across each university would have also been useful. A more detailed approach to the study of non-users is as important as users of ICT if we are to understand various aspects of social life in the "information age" (Selwyn, 2003:101). Non users are likely to have different reasons for their lack of engagement with the Internet and may not just be due to accessibility issues (both economic and social) but may also be because individuals deliberately chose not to use such technology or have used the Internet and other technologies in the past but no longer use the medium for a variety of reasons (Wyatt et al., 2000:36). Ethnographic methods (such as participant observation and student diaries) may be more productive in developing a more rigorous understanding of students' experiences of higher education; though these methods suffer from problems, such as those that arise from using self–report data or directly observing students (Murphy and Scott, 2003:1-6). However, all techniques have positive and negative features, thus it is useful to use these alongside other methods such as usage statistics (e.g. Crook, 2002). Further, the use of longitudinal studies, building up relationships with the students over time to learn more about their experiences may also be insightful. In addition, the use of WWW for a variety of purposes across the university, such as for research and communication (see for example the work of Cornford and Pollock, 2003) would have been useful to place how the web was being used for teaching and learning within a more detailed social context. Finally, a greater focus on factors typical in political economy approaches, such as the role of commercial organisations, the commercial shaping of technology and relevant macro concerns, such as current employment rates and globalizing forces might have further illuminated the findings here.

A second likely criticism of this research is that it does not tackle cost effectiveness or even educational benefits in a systematic way, which would be of value to many in the higher education sector (see chapter 2). However, if one does not take a deterministic approach to the study of society and technology then this question cannot be answered in a straightforward fashion, due to the complexity and variety of individual and social influences and the likelihood that the use of ICTs have

[62] This was not due to a decision on the part of the researcher, all students were asked to take part in the research but only those who used the technology participated in the more qualitative aspects of the project.

numerous potential influences that cannot be reduced to "good" versus "bad" debates (Burbles and Cllister, 2000:10-11). While it is acknowledged that technology should not be seen to have direct effects, lecturers and universities need to have some information on which to base individual and institutional decisions. Seemingly simple questions of effectiveness studies are initially attractive, but the further one goes down the route the more difficult the questions become, for example, what is meant by educational outcomes, and how can one account for all the different factors that may relate to the way technology is adopted and used in various contexts? Research of cases such as this can help guide educators to make their own decisions about the use of the web in their own teaching, and together with lecturers' experiences will lead to an improved level of professionals knowledge about this topic - similar to that a lecturer has about more traditional methods of teaching and learning. Such work will also lead to the development of theories on this topic and the findings from these primarily qualitative studies could inform the development of more quantitative research.

Crucially, future research needs to be able to counter the strong techno deterministic, overly optimistic accounts of the use of the web in teaching and learning in higher education. As the research in this area is patchy what is suggested is further, careful case studies that take note of the shortfalls of this and other studies in order to provide greater understanding of the area. The difficulty with such an approach is that, despite the techno optimists having a lack of convincing evidence for their views, will still counter any criticisms by dismissing accounts such as this due to a lack of generalizability. Thus what is needed, to the extent it is possible, is statistical sampling of cases or the use of more analytical generalizations. In addition, extensive use of mixed model studies that incorporate a greater quantitative element than the study here, for example, a survey of staff opinions on the institutional and personal motivations to use the WWW in teaching and learning across the whole university of which the case is part. Once more understanding is reached large-scale survey research may be possible, although how meaningful data could be collected, without veering towards a deterministic approach, would be challenging. For example, it is likely that such surveys would need to consider the type of institution, the kind of course, and the types and backgrounds of students and the role of ICTs within the course. How questions could be developed that would capture the diversity of different initiatives and not simply focus on technology would be difficult, though

this research would be useful, particularly in terms of swaying policy makers. Thus, variations of mixed models using both quantitative and qualitative methods are likely to be most appropriate way forward.

In the concluding chapter a summary of the research is provided, including the aims of the research, a review of the main findings and suggestions for further work in this area.

10. Conclusion

Without doubt, the higher education system in the UK has undergone major changes over recent decades. Dominant discourses about ICTs in higher education typically promote new technologies as the "solution" to many of the problems facing the contemporary university, and believe it will transform the sector as we know it. In the policy literature new technologies are viewed as a good thing, bringing "obvious" benefits once a few initial problems have been sorted out. What is surprising, is that such enthusiastic accounts typically lack consideration of the variety of different contexts and individuals that make up the higher education system and ignores the dearth of evidence to support such overwhelmingly positive views. The stress on technological potential has led to a lack of attention being given to the complex range of relations that are involved in practical instances of educational innovation, and how the adoption and use of new technologies is likely to differ in various social contexts.

Thus, this study arose from a concern with the overly simplistic statements about the use of new technologies, specifically the WWW in higher education, and the positive effects this appeared to have for students, lecturers, the institution and the sector as a whole. From the outset, this research rejected the notion that debates around new technologies should be reduced to a "good" versus "bad" deterministic approach. It responded to the call for a more empirically grounded study of the relationships between society and technology and supported a socio–technical approach to the study of new technologies and higher education, drawing on the field of social informatics. Thus, it stressed the importance of a range of cultural, social and technological factors in the design, use and adoption of the WWW in teaching and learning. Adopting a case study approach, utilising a communications framework, the research explored specific examples of the development and implementation of the web in university modules, within the broader institutional and national context. It aimed to contribute to: 1) the debates around the virtual university and the future of higher education through the exploration of on the ground experiences; 2) the study of the relationship between technology and social life; and 3) educators' knowledge about the ways in which the WWW could be incorporated into their teaching and the potential consequences of such a move.

This study was exploratory and to a great extent achieved the intended aims of the research. Though there were some similarities to the vision typically promoted through government policy documents and techno optimistic voices, for the most part the research here did not support such views. The two universities, similar to many across the country, are changing in nature and role; serving the needs of the society though provision of a mass education system geared increasingly towards the needs of the workforce, competing on a global and local level for students and research contracts, promoting innovation and research within the UK economy, and striving towards these and many other goals within a sector currently experiencing a steady reduction in funding. Though potential could be seen for ICTs to be used in some of the ways suggested in policy documents (e.g. flexibility of delivery and for distance learning markets) thus far the extent to which ICTs were being used as a "solution" was far less significant than the dominant discourses suggest. Indeed, it was clear that currently the WWW was not leading to a radical transformation in teaching and learning in the two universities of interest here. Further, while the potential could be seen for the web to be increasingly used to enhance campus based education, it was not leading to significant changes in the teaching and learning processes at either university, nor was considered likely to in the near future, due to a range of factors.

From the research there are clearly a number of inter-related issues at work. From a institutional perspective the use of the web may not be adopted to a great extent for campus based learning because of the increase in costs involved, the inappropriateness of the web for teaching all subject matter, and the potential reduction in face-to-face contact which was not demanded by the students. On an individual level both students and staff only used the WWW for teaching and learning to the extent to which they found it useful and this varies according to the individual and the context within which the individual is part. Factors that may influence use include: level of technical skills, experience of using the medium, expectations of what the individual will get from it, and the perceptions of the importance of the use of the web for teaching and learning within the individual's university experience. All of these factors are to some extent shaped by the individual's perception of the current social context, previous experiences and characteristics. There are numerous aspects that will contribute towards the current social contexts at a university. Some of these features, such as incentives for staff, or

computer training for students, will influence individual's use and these can be controlled to an extent by the university, e.g. through greater investment and changes in policy, yet the adoption of technology is far more complex than simply attending to these more practical aspects, and will be influenced by the existing culture within which the WWW is introduced.

It is easier to see how the web may be adopted more straightforwardly in areas where the campus and contact between staff and students is more limited, such as in distance learning or CPD markets. In this study, the focus was on campus-based education and thus the students' motivations, perceptions and understanding of reading for a degree at university is likely to be different to part-time distance learners. Individual needs, motives and the context of learning are likely to differ for various universities, departments, programmes and students, and the intended and actual use of the WWW is likely to vary according to the aims of the university education and student motives for studying. Thus, through exploring practical instances of educational innovation this research has indicated the mesh of interrelating factors that are at work when using the web in teaching and learning. The complexities apparent in the cases here are typically ignored in the hype that often accompanies debates in this area. The use of ICTs are being introduced within the different cultures of universities and are being adopted alongside existing characteristics and functions identified in current and previous times. The finding here, similar to those throughout the history of communications research, is that the dominant claims of direct, clear, sweeping effects is unfounded.

The use of a communications model to organise, conduct and analyse the research has been particularly beneficial and could be useful in other studies. It encourages scholars to explore four key areas in society and technology studies (i.e. production, content, audience and context); it is versatile both in terms of the context in which it is placed (e.g. different universities or other organisations) and the ways different mediums or different uses of the same medium can be explored; and is useful for bringing together a mix of both quantitative and qualitative methods and linking micro and macro concerns.

As stated above, this study set out to contribute to the debates around the future of higher education through the exploration of on-the-ground experiences; the study of

the relationship between technology and social life; and to provide educators with some insight about the use of the WWW in teaching and learning that could be utilised in their own practice. To a great extent it has achieved these goals. Nonetheless, improvements could be made. Broadly speaking, the main difficulties with the research arose from the need for a greater understanding of the social contexts of which the case study modules were part, both from the perspective of staff and students (including non-users). While the study provided some insight into the complexity involved in the use of the WWW in teaching and learning more detailed, comprehensive work needs to be carried out employing a variety of methods not utilised here, such as student diaries, student usage statistics and observation. Further, mixed model studies are thought to be the most productive in this under researched area, and certain types of study design could aid with generalizability, and provide more persuasive arguments to counter the techno-deterministic accounts of the use of the WWW in teaching and learning in higher education. While there are difficulties with the study, it has made a useful contribution to this area. Notably, revealing the complexities involved - highlighting some of the issues that influence the adoption of the use of the WWW in teaching and learning and the importance of considering the individuals, the use to which the technology is put and the context within which this takes place - and promotes a useful, yet simple model to explore this phenomenon further.

11. Appendix

11.1 The qualitative framework for the analysis of each case study website

The framework below has been designed to analyse the case study websites as outlined in chapter 4. The framework has seven sections: aim of site, content, features, structure, navigation, presentation, and accessibility. Each of these are discussed in turn below.

Aim of site

For each case study, a brief description of the content, purpose and level of each module will be outlined from interviews with the lecturer, analysis of course documents and analysis of the website. In addition, the role the web plays within each module will be discussed. As Pellone notes some websites may incorporate all of the elements required for classroom teaching, while others may only use one or two to support more traditional teaching methods (Pellone, 1995:72). Indeed, some researchers have categorised websites depending on how the web is used and the degree to which it supplements or replaces traditional methods of teaching. Barron (1998) makes a distinction between four different kinds of web-based delivery. The first, email correspondence instruction, is where instructions and assignments are sent from the tutor to the student via email and the course notes are typically paper based. The second, web-enhanced instruction, is where the web is used as a supplement to traditional methods incorporating class specific links. The third, web – managed instruction, is where a MLE is typically used for course organisation and there may be interaction through discussion boards. The fourth, web-delivered instruction or web-based training is a stand-alone web-based course (Barron, 1998:356).

Bonk et al., 1999 have proposed a ten level model for incorporating the web into teaching and learning. The scale runs from the most minimal use of the web to the use of the web for an entire course, and considers the potential benefits / problems for both tutor and student. The stages are as follows: 1) placing of syllabi on the web; 2) addition of links for students to explore; 3) student work posted on the web; 4) resources provided for the student by the tutor (e.g. lecture notes, slides and discussion boards); and 5) where different tutors from around the world can use the

same resource in different ways (Bonk et al., 1999:5-9). For these five levels participation on the web is completely voluntary, existing as a supplement to traditional teaching and there is no assessment attached to using the website (Bonk et al., 1999:9). The next five levels are as follows: 6) participation on the website is graded, e.g. through online discussions; 7) where communication via the web extends outside the registered members of a course to others such as practitioners or other experts; 8) the web replaces all traditional teaching but is still intended for those who have access to campus and facilities (e.g. a library and computer rooms); 9) a distance learning module; and 10) a distance learning module that is part of an on-line course (Bonk et al:1999:10-15).

Thus, what role the web plays in the module will be determined by looking at factors such as: the extent of the online material, if it is a replacement of supplement to traditional teaching methods, and if assessment is involved or participation is purely voluntary. A further factor that shall be considered is why this particular information is on the web (Boshier et al., 1997:337). That is, to consider the value of the web over other tools that may be available to the academic.

Content

For the purposes of this framework content refers to the specific elements that are on the website not the accuracy or relevancy of the content (as it is assumed subject experts are the best people to determine this). Thus the availability of features such as, lecture notes, links to resources and discussion boards will be considered; alongside the potential benefits of each of these elements for the students.

One element that may be available on the web is the course syllabus or aims and objectives of the course. The placing of syllabi on the web can help to market the module to potential students as they can decide if they want to take a course and help students who are already on the course as they can access an up-to-date version of the syllabus (Bonk et al., 1999:5). The placing of aims and objectives may also help students when it comes to revision purposes to determine exactly what is required of them.

A second element that may be available on the web is lecture notes or power point presentations. This may assist students reinforce what they have learned in lectures,

help them to prepare in advance for the lecture (e.g. preparing questions to ask and allows them to simply listen to the lecturer without the need to take a great deal of notes) and allow them to miss lectures (e.g. due to sickness or because they have other priorities, such as work) (Bonk et al., 1999:12).

A third resource could be the use of the web to provide the students with resources that are difficult to obtain, e.g. library resources where the number of books are limited. This can make learning more efficient, as the time saved getting resources immediately as oppose to going to the library can be used to increase "time on task" (Chickering and Ermann, 1996:5).

A further element is student work that can be posted on the web. This can help current and future students and save the tutor time in creating web resources. It helps students to see what is expected of them and helps the tutor to make it clear the standard that is required. Students who know their work will be on display are more likely to try hard and this feature may create a sense of community among students and encourage collaborative learning. However, one danger may be increased attempts at plagiarism (Bonk et al, 1999:7).

Links can also be an element of using the web for teaching and learning. There are two main types of links: 1) external that lead to pages outside the module site and 2) internal links that link various pages of the website to assist in navigation. In this section the focus will be on external links. External links encourage students to explore the topic in more depth, help them to gain an overview of the whole topic, and stimulate personal interest in the subject. External and internal links are said to encourage deep learning as the user can read and assimilate a variety of views and explore the topic in depth. However, this may not always be the case (this will be considered further in the section below). In addition, tutors can encourage students to contribute to the list, thus enhancing a collaborative approach to learning (Bonk et al., 1999:6).

There is a general consensus about the use of links: 1) links should be kept up to date because links that do not lead anywhere merely frustrate the user and may lead them to question the validity / usefulness of the site; 2) external links should be relevant and accurate; 3) the website should inform users if the link is external or internal; 4)

users need to be informed about the nature of sources and what to expect (Tweddle et al., 1998:265); and 5) designers should consider the balance of external and internal links (Grassian, 2000:1) as there is a risk with external links that a user may go to another site and not return (Whittington and Sclater, 1997:1-7)

Some of these features above will require a level of interactivity. One of the principle advantages of the web may be that it can be used in a very interactive way. Indeed, Boshier et al., 1998, proposed that the differences between good and bad web-based courses were an interaction between three variables: accessibility (in terms of navigation, not availability of computers), interaction and attractiveness for distance web-based education courses. Interaction included factors such as interaction with materials, users posting findings for other users to see and communication tools to enable discussion between student and tutor and student and student. Indeed, these features may encourage a more collaborative approach to learning with less emphasis on a didactic method of teaching where the teacher is in control (Boshier et al., 1997:339-345).

The use of discussion boards have several advantages: it encourages student to student and tutor to student communication (Barron, 1998:364); helps students who are particularly shy in seminars to have their say (Chickering and Ermann, 1996:4); and similar to posting student work students will try their best as they are aware their work is on show (Bonk et al., 1999:8). However, there is a consideration as to whether online contributions should be assessed or not. If discussion boards are not assessed students can feel free to discuss the topics in a way they want to but there is the danger that if it is not marked they won't participate, as assessed work will take priority (Bonk et al., 1999:8). By marking online contributions this can encourage students to interact more with the course materials and enhance a sense of a learning community as everyone is contributing. However, the nature of the contributions may change and assessment criteria may take priority over debating the topic freely (Bonk et al., 1999:10). It may also be beneficial to extend communication via the web to others outside the course such as practitioners or other experts to enable students to gain a variety of different perspectives other than the tutors and other classmates (Bonk et al., 1999:11).

Thus, through website analysis the various elements of each site that are available will be outlined and the potential benefits of each explained.

Features

The addition of multimedia features such as a graphics, video clips or audio may enhance the website. These features can be used merely to add interest, assist in explaining a concept or be used in place of text as the whole information source. They are also particularly useful if the web is being used in an interactive way, for example, for creating "real life" case studies. The use of graphics or audio may also assist in creating websites that will allow for differences in cognitive styles, learning styles and leaning strategies.

However, while there may be some advantages of using these types of features, writers have suggested that multimedia must be used appropriately and the size should be limited to help download times (Barron, 1998:360; Boshier et al., 1997:345). Designers should also consider how the addition of such features may have an educational advantage but may be outweighed by the potential frustration students will feel if the equipment does not work properly or the extra workload on support staff when things go wrong (Halliwell, 2000:125).

Thus here each website will be assessed to determine what graphics/audio features/video are available on the website and determine the function each of these features is to serve.

Structure

Hypertext theory suggests that ideally any user can navigate the WWW in any way they wish, making their own connections and comparisons as they surf. However, in reality this is not the case as not all web pages are linked in an equal way to all other pages. The web pages of a site can be linked in a variety of ways, but they are dependent on the decisions the designer makes when creating the website (Jackson, 1997:8). To a greater or lesser extent the way a user navigates the site will be dependent on the way it has been structured. Despite this, the web typically gives users more control over what parts of the website to look at and in what order compared to a typical lecture or other teaching method. This may mean that students also have more control over how they learn and how they make connections between

the different pieces of information that are presented on the same website or how this relates to information on other websites. How a student uses the site and makes connections between different pieces of information may influence understanding or time to taken to understand a particular concept.

Web pages can be linked in a number of ways; three stages along a continuum are outlined by Oliver and Herrington (1995). They suggested that pages could be linked in a linear way, i.e. where one page is linked to another and students are encouraged to follow a particular path through the site. The second structure is termed hierarchical, where students can explore topics at differing levels of depth and have more control over the way they navigate the site compared to websites with a linear structure. The third structure that can be identified is termed referential; where students do not really have any structure imposed on them and they can navigate their own way through a site (Oliver and Herrington, 1995:12). Some researchers argue that students should be guided through the website because if they are left to move freely among the web pages they will miss information and not learn as well because they do not have the necessary skills to navigate the site. Alternatively, others suggest that the ability to search and contrast information on the topic encourages deep and active learning.

It may be that the appropriate structure will depend on the students and the nature of knowledge that needs to be learned. For example, more independent learners may be suited to a website with a referential structure, the linear model may be best for initial levels of knowledge acquisition, and either the hierarchical or referential structure may be more suited to students who need to acquire higher order understanding, where learners can then make decisions for themselves (Oliver and Herrington 1995:13). The situation in not clear cut, partly because despite efforts of instructional designers to direct users students may still not use the website as intended, for example skipping important pages or ignoring instructions (Oliver and Herrington, 1995:13). In addition there is not a strong evidence base, as Dillon and Gabbard note, "evidence from studies of hypermedia structural variables suggests a particularly limited knowledge base in terms of how best to organise information in a digital form that exploits the cognitive capabilities of learners to link and organise new information" (Dillon and Gabbard, 1998:334).

Thus here, the structure of the module site will be determined by creating a map of the site to demonstrate the relationship between the pages. While this map will be biased, reflecting the way the researcher would navigate the site to a certain extent, it provides a useful indication of the level of complexity of each site and provides the reader with a greater understanding of the website that is the focus of study.

Navigation

In a hypertext system, common problems that users encounter include: getting lost, being unable to find the information they want, not obtaining an overview of the topic area, and not navigating through the site in a structured way (Allinson, 1989 cited in Stanton et al., 1992:431). If a user has problems with navigating a site this is likely to lead to problems learning from it. Thus, some researchers have proposed that the use of certain tools such as maps or guides may assist the user in navigating the site to overcome these difficulties. However, what navigational aids are appropriate are likely to vary depending on the task the user is required to complete, and navigational aids may actually reduce the overall educational effectiveness of the site or increase the cognitive load of the user, thus making it more time consuming to achieve the same task. For example, a search facility may also be useful to the user, but will find waiting a long time for search results frustrating (Morkes and Nielsen, 1997). More research is required (Stanton et al., 1992:444).

Here, the tools, such as menus, back / forward buttons, site maps and search facilities that are available to assist the user in navigating each case study website will be identified.

Presentation

There are a number of suggestions designers have proposed to enhance the presentation of a website and increase readability. For example, researchers suggest that each screen should have a similar format, to ensure the look and feel of the site is consistent; thus assisting the user in knowing where to look for particular pieces of information (Pellone, 1995:74). Instructional displays should have some blank space so that the page does not look cluttered (Pellone, 1995:74). However, too much white space can be problematic as then the user has to scroll up and down the page and this can be off putting (Schneiderman, 1997:18).

Barron (1998) has identified three different types of screen presentation. The first type, page based, is where if the user operates the scroll facility everything on the page goes down or up. The advantage of this type of presentation is that this screen design will be accessible to all, regardless of computer type or size, but it causes frustrations of scrolling and the menu also disappears. The second type is frame – based, i.e., some pieces of the page are static, such as the header and the side menu and only one part moves when the user operates a scroll bar. However, problems occur because it is more difficult to print and the time for pages to download is increased. The third type, screen based, requires a plug in which may be off putting to some users, but once it is installed it has the advantage that the whole screen is filled and there is no need for a scroll bar (Barron, 1998:358).

The text on the screen can be presented in a similar way to that on paper (Pellone, 1995:74). However, the amount of text needs to be limited as web users tend to scan text for the information they require and they prefer short, concise sections as oppose to scrolling through long pages of text (Nielsen, 1997a cited in Morkes and Nielsen, 1997). A balance must be struck between the amount of information on a page as too little can be as problematic as too much. This is quite difficult as it will, in part, depend on the screen size and this is not in control of developers (Benyon et al. 1997). Designers should only use a long page with no links if students are expected to read the whole piece from beginning to end. The use of a structure that will guide users to the section they want is useful, but the structure shouldn't be too fragmented. Consideration also needs to be given to those who want to read / print the whole text (Schneiderman, 1997:16). In general, there should be no need to scroll for any user on the home page, and other pages should be one to three screens in length (Barron, 1998:361).

When writing for the web the designer should appreciate the usual rules for good writing. For example, one topic per paragraph and an inverted pyramid writing style. It is important to note that some readers only read the first sentence of the text to determine if it is relevant (Morkes and Nielsen, 1997). In addition to a well structured piece of text, designers should help readers understand the content, for example, by providing extra information to explain difficult words and encouraging users to think about what they have read through interactive exercises (Oliver and Herrington, 1995:17). Also, the language must be appropriate for the target audience

(Tweddle et al., 1998:265) and important themes can be emphasised through colour and/or fonts (Schneiderman, 1997:18). Indeed, the colour scheme of the website can help readability (Tweddle et al., 1998:265). It is suggested that colour combinations that would strain the eye should be avoided; often designers will use no more than four complementary colours. The background should be simple and not distract the user (Bonk et al., 1999:5) and there should also be a large contrast between text and background screen (Barron, 1998:360)

Thus, in this study the following presentational features will be explored through website analysis: use of white space, page layout, colour scheme, amount of text on a page, and the way the text is written.

Accessibility

For the purposes of analysing the website the ease that students can use the site, given the computers they are able to access is an important issue to consider. When designing the website it is vital that the tutor considers where students are likely to access the web from. For example, if they are using it at home will users be able to download information relatively easily despite the fact they may have low bandwith connections (Whittington and Sclater, 1997:2). Users are likely to be frustrated by long download times (Morkes and Nielsen, 1997) and may not use the site. Designers should also consider if the site will work smoothly with the software and hardware students are likely to be using (Trochim, 1996:6). Also, designers should consider the size of the computer screen that students are likely to be using, as discussed above, a small screen will result in a reduction of white space and an increase in the amount of scrolling a student will need to do. Finally, designers also need to consider if the website should be password protected, particularly if students are taking part in online discussions, or there is a need / wish to protect the content of the website.

Thus in this study analysis of the website will be carried out with regard to the aim of site, the content available, the features, the type of structure, the tools to aid navigation, the overall presentation, and the accessibility of each case study site. Further perspectives on these issues will be obtained through analysis of interviews with students and staff, focus groups with students, student questionnaires and document analysis. The results are summarised in chapters 6 and 7.

11.2 The original research propositions

Social context

- What pressures are universities in England currently facing?
- How is the nature and role of universities changing in response to these pressures?
- In the two universities studied here how are the institutions and departments responding to these changes in role through the support of technological innovation in teaching and learning?
- What impact do changes at the national, institutional and departmental level have on the role of academics in the two case study institutions?

Production

- What are the main motivations and/or incentives for academics to use the web as a teaching tool?
- What are the main barriers university staff face when trying to use the web as a teaching tool?
- What are the main motivations and/or incentives for innovators to use the web as a teaching tool?
- What are the main difficulties innovators face when trying to use the web as a teaching tool?
- Why did the producer (of the case study module) use the web for that particular course/component of a course?

Content

- How were the case studies sites conceptualised and produced?
- How are the sites presented?
- How does the way the sites are presented effect usability?
- How does the way the sites are presented influence the way students learn?

Audience

- What are the social and physical contexts in which learning takes place?
- How are social relationships (with other students/lecturers) altered by using the web in teaching and learning?
- What barriers do students experience when trying to use web-based courses?
- How educationally effective is the web is as a teaching tool? Where can it be used most appropriately?
- What are the students' learning styles? How does this relate to use, opinion and performance?
- What is their level of competence in using the WWW? How does this relate to use, opinion and performance?
- Do student characteristics, such as age, gender, experience in higher education relate to use, opinion and performance?

11.3 Research instruments

The questions asked varied slightly according to the position and experience of the participant. Below provides a summary of the areas covered in each interview and the kinds of questions the interviewer asked the individual following a general introduction about the research project.

For all interviewees:
Role/experience

- Please describe your role(s) at the university.
- How long have you been working at this institution, what was your original role and how has it developed from the time you have been here?

"Location" within the university

- What are your links with other people/departments across the university? Who do you support? How are you supported?

The use of the web in teaching and learning at the university

- There has been a great deal of discussion in recent years about the changing roles of the university. Have you seen any changes in the time that you have spent here?
- What do you think are the main motivations (if any) for this university to develop and implement the WWW in teaching and learning?
- What is your understanding of the university-wide strategy on using the WWW for teaching and learning?
- What do you see as the main advantages of using the WWW for teaching and learning?
- What do you see as the main disadvantages of using the WWW for teaching and learning?
- Where do you think the university will be in five years time with respect to the use of the web in teaching and learning?

The lecturer experience

- How are staff encouraged/motivated to use the web in teaching and learning? What do you think are their main motivations?
- What do you think are the main barriers/difficulties facing lecturers who develop or wish to develop web-based resources?

The student experience

- What level of demand is there for the use of the web in teaching and learning from campus-based students?
- What advantages will the use of the web have for the student experience?
- What difficulties might students encounter when using this medium?

Is there anything else you want to comment on?

Additional questions for managers:

- Are you actively encouraging lecturers to use the web in teaching? If so, how?
- Are you aware of any web-based initiatives in teaching and learning that are happening in your department / school / university? If so, what are they?
- What support do your staff have access to?

Additional questions for innovators:

Motivations/reasons for using the WWW

- What were your main motivations for beginning to use the web for this course?
- Do you see the development of a website as an addition to the existing course or as a replacement to some/all traditional teaching?
- What teaching methods are you using?
- What would you like them to get from the website you have designed?

Developing the site

- Were you responsible for setting up the site? If so, did you have any training/support from the university (at the beginning and ongoing)?
- Prior to this how strong were your computer skills?
- If a technician helped you – how did that relationship work?
- How long did it take to develop the course?

Student experience

- From your perspective, how has the use of the web been received so far?
- How did the students react at the beginning of the course when they found some/all teaching would be done via the web?
- What do you think are the main benefits / difficulties students are finding?
- Are the students using the web in the ways you hoped?

Lecturer experience

- What support have you received? (E.g. from heads of department, colleagues, central support etc?)
- What have been the advantages/disadvantages for you?
- Has using the web changed your relationships with your students in any way? If so, how?
- Would you set up another course on the web? Why would you do so? What would be the main reasons not to?
- If you were giving advice to somebody just starting out on developing a web-based resource what advice would you give to him or her?

Additional questions for technicians:

- Did you experience any administrative or technical difficulties when designing the course?
- When the course was up and running how much support did you need to give the lecturer?
- Do you think people involved in the development of web-based resources at this university get enough support? If not, what would be useful?
- What was your relationship with the lecturer(s)? How do you prefer to work?
- How much advice did you give the lecturer about educational design aspects? Did you find yourself offering ideas about ways to present material?
- Is it important for a web designer to have an understanding of educational issues or not? Why?
- How long did it take to develop the course?
- What software did you use? Is it university-approved? What are your opinions on it?

WEB-BASED COURSES IN HIGHER EDUCATION

This questionnaire is part of a research project that explores the use of the web in teaching and learning in universities. Its purpose is to gain information about your views of the use of the web in this module. All responses are confidential. Your response will provide important evidence for the further development of the use of the web in universities.

Please write your responses in the spaces below and/or tick the boxes provided.

ABOUT YOU

◊ My name/student ID number is.....

(This information will only be used to link your responses below to a future questionnaire)

◊ I am a ☐ Full-time student ☐ Part-time student

◊ I am ☐ Male ☐ Female

◊ I am in my ☐ Year of higher education

◊ My degree title is:.....

◊ I am ☐ 18-20 ☐ 21-23

☐ 24-26 ☐ 27-29

☐ 30-32 ☐ 33-43

☐ 44-54 ☐ 55+

◊ Before entering higher education I did ☐ 'A' levels

☐ A BTEC National Dip. ☐ An access course

☐ A (G)NVQ

☐ Other (please state).....

COMPUTER EXPERIENCE

◊ Have you had any formal training in using the WWW? *(E.g. As part of a qualification or course at school or university).*

☐ Yes ☐ No

If yes, please briefly describe the training.

◊ On average, how often do you access the WWW?

☐ Daily ☐ Weekly

☐ Fortnightly ☐ Monthly

☐ Every couple of months ☐ Never

☐ Other (please state).....

◊ What (if anything) have you used the web for? *(Please fill in as many boxes as apply to you, putting a 1 for the most important, 2 for the next important and so on).*

☐ Entertainment ☐ Shopping

☐ Contact with others ☐ Information

☐ Education

☐ Other (please state).....

◊ I have access to the web from my term time address

☐ Yes ☐ No

◊ Please circle the number of other university modules that you have taken that use the web for teaching and learning.

0 1 2 3 4 5+

EXPECTATIONS OF THE COURSE

◊ What (if any) are your main concerns about using the web for this module? *(Please explain your answer).*

◊ In your opinion, what (if any) are the main potential benefits of using the web for this module? *(Please explain your answer).*

◊ What are the most significant things that you hope to learn from this module ?

MANY THANKS FOR FILLING IN THIS FORM

WEB-BASED COURSES IN HIGHER EDUCATION

This questionnaire is part of a research project that explores the use of the web in teaching and learning in universities. Its purpose is to gain information about your views of the use of the web in this course. All responses are confidential. It would be helpful if you could give your name/student ID number, as it means we can pair up this questionnaire with the first two questionnaires. Your response will provide important evidence for the further development of the use of the web in universities.

Please write your responses in the spaces below and/or tick the boxes provided.

◊ My name/student ID number is.....

◊ I access the website for this course from:

☐ University ☐ Home

☐ University and Home ☐ Other (please state).....

◊ On average, how much time did you spend using the website each time you accessed the course site?

☐ 0-20 minutes ☐ 20-40 minutes

☐ 40 minutes - 1hour ☐ 1-2 hours

☐ Other (please state).....

◊ On average, how often did you access the website for this course?

☐ Daily ☐ Twice – three times a week

☐ Once a week ☐ Once a fortnight

☐ Monthly ☐ Other (please state.....

☐ Never (please explain why).....

.....

◊ Did you access the website for this course more at certain times during the module than others? If so, please describe when and why.

◊ For each of the statements below please circle the number that most represents your view.

I would have liked more training in the use of the technology before I began this module.

Strongly Agree 1 2 3 4 5 6 Strongly Disagree

The website was difficult to operate.

Strongly Agree 1 2 3 4 5 6 Strongly Disagree

The website was well presented.

Strongly Agree 1 2 3 4 5 6 Strongly Disagree

I enjoyed using the web for this subject.

Strongly Agree 1 2 3 4 5 6 Strongly Disagree

The web did not fit in well with the rest of this course.

Strongly Agree 1 2 3 4 5 6 Strongly Disagree

I don't want to have more modules that involve the web.

Strongly Agree 1 2 3 4 5 6 Strongly Disagree

I could always access the web for this course when I wanted to.

Strongly Agree 1 2 3 4 5 6 Strongly Disagree

Using the technology will help me to get more marks.

Strongly Agree 1 2 3 4 5 6 Strongly Disagree

Using the web for this module helped me to learn about the subject.

Strongly Agree 1 2 3 4 5 6 Strongly Disagree

Using the web for part of this module meant that I didn't get to know the other students' in my class as well as I usually do.

Strongly Agree 1 2 3 4 5 6 Strongly Disagree

Using the web for part of this module meant that I didn't get to know my tutor as well as I usually do.

Strongly Agree 1 2 3 4 5 6 Strongly Disagree

Using the web for this module was well worth the time I spent on it.

Strongly Agree 1 2 3 4 5 6 Strongly Disagree

◊ Any further comments on any of your responses above?

◊ Did you have any concerns about using the web for this course at the beginning of the module? If so, please explain what these concerns were and if these concerns have, or have not, been realised.

◊ Did you think there would be any potential benefits of using the web for this course at the beginning of this module? If so, please explain what these potential benefits were and if they have, or have not, been realised.

◊ In general, what has been good about using the web to learn on this module? *Please give reasons for your answers.*

◊ In general, what has been bad about using the web to learn on this module? *Please give reasons for your answers.*

◊ What do you think the lecturer was trying to achieve by using the web for this course?

◊ In what ways (if any) could the website for this course have done more to help you?

◊ What do you think you have learned that you hoped to learn from this course?

◊ What do you think you haven't learned that you hoped to learn from this course?

◊ Did you learn anything that was unexpected?

◊ Any other comments? *Please continue on a separate sheet if necessary.*

THANK YOU FOR FILLING IN THIS FORM

ASSIST
Approaches and Study Skills Inventory for Students

This questionnaire has been designed to allow you to describe, in a systematic way, how you go about learning and studying. The technique involves asking you about 50 questions which overlap to some extent to provide good overall coverage of different ways of studying. Most of the items are based on comments made by other students.

Please respond truthfully, so that your answers will **accurately** describe your **actual** ways of studying, and work your way through the questionnaire quite **quickly.** Please work through the comments giving your **immediate** response. In deciding your answers, think in terms of your course. If you have not yet encountered a particular situation in this course try to imagine how you would react. It is also **very important** that you have answered **all** the questions: please check you have.

Your answers will be used for research purposes only, and will be made anonymous in any report based on our findings. If you would like to know what your learning style is please give your name and email address. Even if you don't want to know what your learning style is it is helpful if you do give your name/student ID number, as it means we can pair up this inventory with the other questionnaire.

BACKGROUND INFORMATION
Please write your responses in the spaces below and/or tick the boxes provided.

- ◊ My name/student ID number is.....
- ◊ I would like to know my learning style. My email address is.....

APPROACHES TO STUDYING

5 = agree (√) 4=agree somewhat (√?) 2=disagree somewhat (x?) 1=disagree (x)
Try not to use 3= unsure (??) unless you really have to, or if it cannot apply to you or your course.

	√	√?	??	x?	x
I manage to find conditions for studying which allow me to get on with my work easily.	5	4	3	2	1
When working on an assignment, I'm keeping in mind how best to impress the marker.	5	4	3	2	1
Often I find myself wondering whether the work I am doing here is really worthwhile.	5	4	3	2	1
I usually set out to understand for myself the meaning of what we have to learn.	5	4	3	2	1
I organise my study time carefully to make the best use of it.	5	4	3	2	1
I find I have to concentrate on just memorising a good deal of what I have to learn.	5	4	3	2	1
I go over the work I've done carefully to check the reasoning and that it makes sense.	5	4	3	2	1
Often I feel I am drowning in the sheer amount of material we're having to cope with.	5	4	3	2	1
I look at the evidence carefully and try to reach my own conclusion about what I'm studying.	5	4	3	2	1
It's important for me to feel that I'm doing as well as I really can on the courses here.	5	4	3	2	1
I try to relate ideas I come across to those in other topics or other courses whenever possible.	5	4	3	2	1
I tend to read very little beyond what is actually required to pass.	5	4	3	2	1
Regularly I find myself thinking about ideas from lectures when I'm doing other things.	5	4	3	2	1
I think I am quite systematic and organised when it comes to revising for exams.	5	4	3	2	1
I look carefully at tutors' comments on course work to see how to get higher marks next time.	5	4	3	2	1
There's not much of the work here that I find interesting or relevant.	5	4	3	2	1
When I read an article or book, I try to find out for myself exactly what the author means.	5	4	3	2	1
I'm pretty good at getting down to work whenever I need to.	5	4	3	2	1
Much of what I'm studying makes little sense: it's like unrelated bits and pieces.	5	4	3	2	1
I think about what I want to get out of this course to keep my studying well focused.	5	4	3	2	1
When I'm working on a new topic, I try to see in my own mind how all the ideas fit together.	5	4	3	2	1
I often worry about whether I'll ever be able to cope with the work properly.	5	4	3	2	1
Often I find myself questioning things I hear in lectures or read in books.	5	4	3	2	1
I feel that I'm getting on well, and this helps me put more effort into the work.	5	4	3	2	1
I concentrate on learning just those bits of information I have to know to pass.	5	4	3	2	1
I find that studying academic topics can be quite exciting at times.	5	4	3	2	1
I'm good at following up some of the reading suggested by lecturers or tutors.	5	4	3	2	1
I keep in mind who is going to mark an assignment and what they're likely to be looking for.	5	4	3	2	1
When I look back, I sometimes wonder why I ever decided to come here.	5	4	3	2	1
When I'm reading, I stop from time to time to reflect on what I am trying to learn from it.	5	4	3	2	1

I work steadily through the term or semester, rather than leave it to the last minute.	5	4	3	2	1
I'm not really sure what's important in lectures so I try to get down all I can.	5	4	3	2	1
Ideas in course books or articles often set me off on long chains of thought of my own.	5	4	3	2	1
Before starting work on an assignment or an exam question, I think first how best to tackle it.	5	4	3	2	1
I often seem to panic if I get behind with my work.	5	4	3	2	1
When I read, I examine the details carefully to see how they fit in with what's being said.	5	4	3	2	1
I put a lot of effort into studying because I am determined to do well.	5	4	3	2	1
I gear my studying closely to just what seems to be required for assignments and exams.	5	4	3	2	1
Some of the ideas I come across on the course I find really gripping.	5	4	3	2	1
I usually plan out my week's work in advance, either in paper or in my head.	5	4	3	2	1
I keep an eye open for what lecturers seem to think is important and concentrate on that.	5	4	3	2	1
I'm not really interested in this course, but I have to take it for other reasons.	5	4	3	2	1
Before tackling a problem or assignment, I first try and work out what lies behind it.	5	4	3	2	1
I generally make good use of my time during the day.	5	4	3	2	1
I often have trouble in making sense of the things I have to remember.	5	4	3	2	1
I like to play around with ideas of my own even if they don't get me very far	5	4	3	2	1
When I finish a piece of work I check it through to see if it really meets the requirements.	5	4	3	2	1
Often I lie awake worrying about work I think I won't be able to do.	5	4	3	2	1
It's important for me to be able to follow the argument, or to see the reason behind things.	5	4	3	2	1
I don't find it at all difficult to motivate myself.	5	4	3	2	1
I like to be told precisely what to do in essays or other assignments.	5	4	3	2	1
I sometimes get hooked on academic topics and feel I would like to keep on studying them.	5	4	3	2	1

THANK YOU FOR COMPLETING THIS FORM

Focus Group Schedule for Students

Question/topic	Possible prompts
General introduction	▪ Introduce myself, tape, project, and confidentiality. ▪ Ask each student to introduce themselves.
General attitudes /comments?	
Experience of using the WWW for this course	▪ Where did you access the WWW for this course? ▪ Did you experience any difficulties logging onto the network/getting a computer? ▪ How much time did you spend on the WWW for this course? ▪ Did you use the WWW more at particular times during the course? Why? ▪ Did you go with a friend from the course to use the computers or did you go on your own? ▪ Did you discuss your on-line contributions with others? ▪ Why did you use the WWW for this course? (E.g. mainly for debating issues, resources, to get course information?)
Design aspects of the website for this course Show some visual prompt (either laptop or OHP)	▪ How easy/difficult was it to use the site? (Any particular features that were helpful/confusing)? ▪ What features of the website did you like the best/least? ▪ What features did you use the most? ▪ If you were designing this course on the web – would you change it? What would you revise delete or add?
Teaching and learning issues for this course	▪ What aspect of the course on the WWW was the most useful? ▪ What do you think you gained from having some of the course on the web? (Educational benefits) ▪ Have you any ideas about why lecturers might have put things on the web? ▪ What do you think was good/bad about having some of the course on the web? ▪ Do you think involvement on conferencing/using the website should be assessed? ▪ What is the extent to which the time you spent on the web was worthwhile?
Relationship with others	▪ Do you think that your relationship with your other course mates/your lecturer would be different or the same if you didn't have the WWW in your course? ▪ What if you had more of the course on the web, replacing other teaching methods? E.g. no seminars face to face.
Further comments/issues?	

11.4 Statistical analysis

Likert Style Statements

In this section, the significant relationships between Likert style statements on questionnaire 2 (using Kendall's Tau) that are not highlighted in chapters 6 and 7 are summarised.

Case Study 1

Agreement with the statement, "*I enjoyed using the web for this subject,*" was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
Using the web for this module was well worth the time I spent on it.	0.545	0.000	71
I don't want to have more modules that involve the web.	-0.485	0.000	71
The website was well presented.	0.446	0.000	71
The web did not fit in well with the rest of this course.	-0.395	0.000	71
Using the web for this module helped me to learn about the subject.	0.316	0.001	71
Using the technology will help me to get more marks.	0.316	0.001	71
The website was difficult to operate.	-0.260	0.008	71

Agreement with the statement, "*the web did not fit in well with the rest of this course,*" was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
I don't want to have more modules that involve the web.	0.443	0.000	71
I enjoyed using the web for this subject.	-0.395	0.000	71
Using the web for this module was well worth the time I spent on it.	-0.383	0.000	72
The website was difficult to operate.	0.244	0.013	72
The website was well presented.	-0.227	0.025	72

Agreement with the statement, "*using the technology will help me to get more marks,*" was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
Using the web for this module helped me to learn about the subject.	0.525	0.000	72
I enjoyed using the web for this subject.	0.316	0.001	71
Using the web for this module was well worth the time I spent on it.	0.287	0.003	72
The website was well presented.	0.243	0.015	72

Agreement with the statement, "*using the web for this module helped me to learn about the subject,*" was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
Using the technology will help me to get more marks.	0.525	0.000	72
Using the web for this module was well worth the time I spent on it.	0.366	0.000	72
I could always access the web for this course when I wanted to.	0.328	0.001	71
I enjoyed using the web for this subject.	0.316	0.001	71
I don't want to have more modules that involve the web.	-0.248	0.010	71
The website was well presented.	0.211	0.035	72

Agreement with the statement, "*using the web for this module was well worth the time I spent on it*," was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
I enjoyed using the web for this subject.	0.545	0.000	71
I don't want to have more modules that involve the web.	-0.494	0.000	71
The website was well presented.	0.405	0.000	72
The web did not fit in well with the rest of this course.	-0.383	0.000	72
Using the web for this module helped me to learn about the subject.	0.366	0.000	72
The website was difficult to operate.	0.388	0.000	72
Using the technology will help me to get more marks.	0.287	0.003	72

Agreement with the statement, "*I could always access the web for this course when I wanted to*," was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
Using the web for this module helped me to learn about the subject.	0.328	0.001	71
Using the web for part of this module meant that I didn't get to know the other students in my class as well as I usually do.	0.299	0.003	71

Agreement with the statement, "*I would have liked more training in the use of the technology before I began this module*," was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
The website was difficult to operate.	0.388	0.000	72
I don't want to have more modules that involve the web.	0.279	0.003	72

Agreement with the statement, "*the website was difficult to operate,*" was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
I would have liked more training in the use of the technology before I began this module.	0.388	0.000	72
I don't want to have more modules that involve the web.	0.347	0.000	71
Using the web for this module was well worth the time I spent on it.	-0.306	0.002	72
I enjoyed using the web for this subject.	-0.260	0.008	71
The web did not fit in well with the rest of this course.	0.244	0.013	72

Agreement with the statement, "*using the web for part of this module meant that I didn't get to know the other students in my class as well as I usually do,*" was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
Using the web for part of this module meant that I didn't get to know my tutor as well as I usually do.	0.481	0.000	72
I could always access the web for this course when I wanted to.	0.299	0.003	71

Agreement with the statement, "*I don't want to have more modules that involve the web,*" was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
Using the web for this module was well worth the time I spent on it.	-0.494	0.000	71
I enjoyed using the web for this subject.	-0.485	0.000	70
The web did not fit in well with the rest of this course.	0.443	0.000	71
The website was difficult to operate.	0.347	0.000	71
The website was well presented.	-0.287	0.004	71
I would have liked more training in the use of the technology before I began this module.	0.279	0.03	71
Using the web for this module helped me to learn about the subject.	-0.248	0.010	71

Case study 2

Agreement with the statement, "*I enjoyed using the web for this subject,*" was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
The website was well presented.	0.531	0.000	52
Using the web for this module was well worth the time I spent on it.	0.480	0.000	53
Using the web for this module helped me to learn about the subject.	0.463	0.000	53
I don't want to have more modules that involve the web.	-0.261	0.025	53

Agreement with the statement, "*using the technology will help me to get more marks*," was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
Using the web for this module was well worth the time I spent on it.	0.421	0.000	55
Using the web for this module helped me to learn about the subject.	0.402	0.000	55
I would have liked more training in the use of the technology before I began this module.	0.267	0.015	55
I could always access the web for this course when I wanted to.	0.246	0.026	55

Agreement with the statement, "*using the web for this module helped me to learn about the subject*," was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
Using the web for this module was well worth the time I spent on it.	0.621	0.000	55
I enjoyed using the web for this subject.	0.463	0.000	53
Using the technology will help me to get more marks.	0.402	0.000	55
The website was well presented.	0.323	0.006	54
I don't want to have more modules that involve the web.	-0.315	0.006	55

Agreement with the statement, "*using the web for this module was well worth the time I spent on it*," was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
Using the web for this module helped me to learn about the subject.	0.621	0.000	55
I enjoyed using the web for this subject.	0.480	0.000	53
Using the technology will help me to get more marks.	0.421	0.000	55
The website was well presented.	0.417	0.000	54
I don't want to have more modules that involve the web.	-0.258	0.023	55

Agreement with the statement, "*using the web for this module was well worth the time I spent on it*," was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
Using the web for this module helped me to learn about the subject.	0.621	0.000	55
I enjoyed using the web for this subject.	0.480	0.000	53
Using the technology will help me to get more marks.	0.421	0.000	55
The website was well presented.	0.417	0.000	54
I don't want to have more modules that involve the web.	-0.258	0.023	55

Agreement with the statement, "*I would have liked more training in the use of the technology before I began this module*," was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
The website was difficult to operate.	0.341	0.002	55
The website was well presented.	-0.313	0.007	54
I don't want to have more modules that involve the web.	0.279	0.013	55
Using the technology will help me to get more marks.	0.267	0.015	55
Using the web for part of this module meant that I didn't get to know my tutor as well as I usually do.	0.247	0.027	55

Agreement with the statement, "*I could always access the web for this course when I wanted to*," was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
Using the technology will help me to get more marks.	0.246	0.026	55
Using the web for part of this module meant that I didn't get to know my tutor as well as I usually do.	-0.239	0.033	55

Agreement with the statement, "*the website was well presented*," was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
I enjoyed using the web for this subject.	0.531	0.000	52
Using the web for this module was well worth the time I spent on it.	0.417	0.000	54
The website was difficult to operate.	-0.351	0.003	54
Using the web for this module helped me to learn about the subject.	0.323	0.006	54
I would have liked more training in the use of the technology before I began this module.	-0.313	0.007	54
I don't want to have more modules that involve the web.	-0.243	0.040	54

Agreement with the statement, "*the website was difficult to operate*," was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
The website was well presented.	-0.351	0.003	54
I would have liked more training in the use of the technology before I began this module.	0.341	0.002	55

Agreement with the statement, "*using the web for part of this module meant that I didn't get to know my tutor as well as I usually do*," was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
Using the web for part of this module meant that I didn't get to know the other students in my class as well as I usually do.	0.704	0.000	55
I would have liked more training in the use of the technology before I began this module.	0.247	0.027	55
I could always access the web for this course when I wanted to.	-0.239	0.033	55

Agreement with the statement, "*I don't want to have more modules that involve the web,*" was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
Using the web for this module helped me to learn about the subject.	-0.315	0.006	55
I would have liked more training in the use of the technology before I began this module.	0.279	0.013	55
I enjoyed using the web for this subject.	-0.261	0.025	53
Using the web for this module was well worth the time I spent on it.	-0.258	0.023	55
The website was well presented.	-0.243	0.040	54

Case study 3

All significant results contained in text in chapter 6. [63]

Case study 4

Agreement with the statement, "*I don't want to have more modules that involve the web,*" was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
Using the web for this module helped me to learn about the subject.	-0.315	0.006	55
I would have liked more training in the use of the technology before I began this module.	0.279	0.013	55
I enjoyed using the web for this subject.	-0.261	0.025	53
Using the web for this module was well worth the time I spent on it.	-0.258	0.023	55
The website was well presented.	-0.243	0.040	54

[63] The smaller number of significant relationships identified between the Likert style statements for this module may be due to the smaller sample size and a high number of paired rankings compared to the responses to these questions on other modules.

Agreement with the statement, "*I enjoyed using the web for this subject*," was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
Using the web for this module helped me to learn about the subject.	0.535	0.000	37
Using the web for this module was well worth the time I spent on it.	0.440	0.001	37
I could always access the web for this course when I wanted to.	0.330	0.013	37
The website was difficult to operate.	-0.314	0.021	37
Using the technology will help me to get more marks.	0.275	0.039	37

Agreement with the statement, "*using the technology will help me to get more marks*," was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
Using the web for this module was well worth the time I spent on it.	0.305	0.023	37
I enjoyed using the web for this subject.	0.275	0.039	37

Agreement with the statement, "*I enjoyed using the web for this subject*," was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
Using the web for this module helped me to learn about the subject.	0.535	0.000	37
Using the web for this module was well worth the time I spent on it.	0.440	0.001	37
I could always access the web for this course when I wanted to.	0.330	0.013	37
The website was difficult to operate.	-0.314	0.021	37
Using the technology will help me to get more marks.	0.275	0.039	37

Agreement with the statement, "*using the web for this module helped me to learn about the subject*," was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
I enjoyed using the web for this subject.	0.535	0.000	37
Using the web for this module was well worth the time I spent on it.	0.530	0.000	37
I could always access the web for this course when I wanted to.	0.295	0.026	37

Agreement with the statement, "*using the web for this module was well worth the time I spent on it,*" was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
Using the web for this module helped me to learn about the subject.	0.530	0.000	37
I enjoyed using the web for this subject.	0.440	0.001	37
I could always access the web for this course when I wanted to.	0.419	0.002	37
Using the technology will help me to get more marks.	0.305	0.023	37
The website was difficult to operate.	-0.272	0.043	38

Agreement with the statement, "*I would have liked more training in the use of the technology before I began this module,*" was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
The website was difficult to operate.	0.559	0.000	38
Using the web for part of this module meant that I didn't get to know the other students in my class as well as I usually do.	0.344	0.018	36

Agreement with the statement, "*I could always access the web for this course when I wanted to,*" was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
Using the web for this module was well worth the time I spent on it.	0.419	0.002	37
The website was difficult to operate.	-0.393	0.004	37
I enjoyed using the web for this subject.	0.330	0.013	37
The website was well presented.	0.321	0.019	37
Using the web for this module helped me to learn about the subject.	0.295	0.026	37

Agreement with the statement, "*the website was difficult to operate,*" was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
I would have liked more training in the use of the technology before I began this module.	0.559	0.000	38
I could always access the web for this course when I wanted to.	-0.393	0.004	37
The website was well presented.	-0.317	0.023	37
I enjoyed using the web for this subject.	-0.314	0.021	37
Using the web for this module was well worth the time I spent on it.	-0.272	0.043	38

Agreement with the statement, "*using the web for part of this module meant that I didn't get to know the other students in my class as well as I usually do,*" was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
Using the web for part of this module meant that I didn't get to know my tutor as well as I usually do .	0.849	0.000	36

Case 6

Agreement with the statement, "*I enjoyed using the web for this subject,*" was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
The website was well presented.	0.361	0.003	48
Using the web for this module was well worth the time I spent on it.	0.291	0.021	46
The web did not fit in well with the rest of this course.	-0.267	0.025	48
Using the web for this module helped me to learn about the subject.	0.256	0.036	48

Agreement with the statement, "*the web did not fit in well with the rest of this course,*" was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
The website was difficult to operate.	0.341	0.007	48
The website was well presented.	-0.335	0.007	48
I would have liked more training in the use of the technology before I began this module.	0.276	0.023	48
I enjoyed using the web for this subject.	-0.276	0.025	48
I don't want to have more modules that involve the web.	0.269	0.026	48
I could always access the web for this course when I wanted to.	-0.269	0.027	47
Using the web for this module helped me to learn about the subject.	-0.250	0.044	48

Agreement with the statement, "*using the web for this module helped me to learn about the subject,*" was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
Using the web for this module was well worth the time I spent on it.	0.663	0.000	46
I could always access the web for this course when I wanted to.	0.325	0.007	47
I enjoyed using the web for this subject.	0.256	0.036	48
The web did not fit in well with the rest of this course.	-0.250	0.044	48

Agreement with the statement, "*using the web for this module was well worth the time I spent on it,*" was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
Using the web for this module helped me to learn about the subject.	0.663	0.000	46
I enjoyed using the web for this subject.	0.291	0.021	46

Agreement with the statement, "*I would have liked more training in the use of the technology before I began this module,*" was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
The website was difficult to operate.	0.376	0.002	48
The web did not fit in well with the rest of this course.	0.276	0.023	48

Agreement with the statement, "*I could always access the web for this course when I wanted to,*" was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
Using the web for this module helped me to learn about the subject.	0.325	0.007	47
The website was difficult to operate.	-0.302	0.014	47
The web did not fit in well with the rest of this course.	-0.269	0.027	47

Agreement with the statement, "*the website was difficult to operate,*" was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
I would have liked more training in the use of the technology before I began this module.	0.376	0.002	48
The web did not fit in well with the rest of this course.	0.341	0.007	48
The website was well presented.	-0.335	0.007	48
I could always access the web for this course when I wanted to.	-0.302	0.014	47

Agreement with the statement, "*the website was well presented,*" was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
The web did not fit in well with the rest of this course.	-0.385	0.002	48
I enjoyed using the web for this subject.	0.361	0.003	48
The website was difficult to operate.	-0.335	0.007	48

Agreement with the statement, "*I don't want to have more modules that involve the web*," was significantly related to agreement with the following statements:

Statement	τ_b	Sig level (2 tailed)	N
The web did not fit in well with the rest of this course.	0.269	0.026	48

Relationship between amount of time spent on line and number of times accessed.

To determine if there was a relationship between the amount of time student reported spending on the case study website per session and the number of times they reported accessing the site, the statistic, Kendall's Tau was employed. The results are in the table below.

Case	τ_b	Sig level (2 tailed)	N
1	-0.149	0.147	71
2	-0.095	0.422	55
3	**-0.404**	**0.006**	**26**
4	**-0.320**	**0.011**	**36**
5	Too small a sample to conduct test		
6	-0.236	0.07	47

11.5 Examples of messages in case study 4.

Topic: Still Birth (1 of 7), Read 104 times **Conf:** Clinical Questions
From: Student midwife S.K.
Date: 19 February 200112:12

Hi all,
I was working on the labour ward at ***** on Thursday and there was a lady on the ward that had an intrauterine death. I was quite upset by this, but at the same time I was - interested to find out more *(shares details of the case)* The midwife that showed me the baby was very gentle and respectful towards the baby and spent time with me asking me if there was anything that I wanted to say or any questions that I wanted to ask and I was very grateful for that.

I felt very aware of what was happening on the labour ward that day, however the other midwives at one stage were laughing particularly loudly in the coffee room and this could be heard throughout the ward, which I felt was very insensitive. It made me realise that it is your behaviour as a whole whilst in the hospital that is important and not just whilst with your woman. I do not think that I will forget the image of the baby for a long time.
S.K.

Topic: Still Birth (2 of 7), Read 98 times **Conf.:** Clinical Questions
From: Student midwife S.H.
Date: 19 February 2001 07:28
Attn: S.K.
Hi S

That must of been quite a difficult experience for you to see so early on however i am glad you were able to look at the situation and the effects on the mother. I was sorry to read that some of the midwives were a little insensitive to the situation however i suppose with them seeing this happen before in their careers they learn to deal with it however i agree there was a lack of consideration as a baby had died regardless of whether it was in utero or during delivery. I think you have handled it well and you will think about the baby for a while yet but hopefully you will probably feel glad you did go and see the baby as you may feel more prepared next time around.

Take care and keep positive, S.H. xx

Topic: Still Birth (3 of 7), Read 45 times **Conf:** Clinical Questions
From: C.M. (Lecturer)
Date: 09 March 200111:39

S.K., thank you for sharing what must be a difficult experience for you. You show considerable empathy for the family and I hope that whilst you will remember the face of that particular baby well into the future your recollections are in part positive.

The Stillbirth and Neonatal Death Society have a website that you may find of interest. This organisation provides support to parents who have experienced bereavement. The group also work with the health service in an attempt to develop services that are more effective in meeting the needs of bereaved parents. http://WWW.uk-sands.org/
C.M,

Topic: Still Birth (4 of 7), Read 94 times' **Conf**: Clinical Questions
From: S.L. (Clinical midwife)
Date: 19 February 2001 09:35
S,

I'm sorry to hear of the sad news of the lady whose baby died at 26 weeks into her pregnancy. Reading your letter I understand your concerns. Though it sounds insensitive, professionals who work in these environments will try and maintain a sense of reality / normality by continuing as usual. This is also a coping / defence mechanism as you have to detach yours from reality of life, and in no way would have intended to be insensitive.

I'm sure that as staff were laughing in their 'coffee room' it was in no way reflective of her situation, at what would have been a very distressing time. I hope this doesn't excuse the midwives behaviour, but serves as an explanation of the realities of midwifery. However often a reminder from a new observer will encourage practitioners to be more aware. Continue to be a caring student midwife and learn from your experience and reflections.
S.L.

Topic: Still Birth (5 of 7), Read 93 times **Conf:** Clinical Questions
From: Student Midwife T.G.
Date: 19 February 2001 10: 19 Hi Sf

Thank you for sharing such an intimate experience. I'm sure that the whole event will remain imprinted upon your memory forever, although in time it could be the first of many. A friend of mine went through a similar experience. Your reflection reminded me of how awful the whole thing had been for her. She was left alone after induction of labour, and when the baby was delivered it was wrapped in a green sheet and removed from the delivery room. She never saw her baby daughter.

I truly believe that had she been 'allowed' to see her baby, hold her, kiss her and say goodbye, the terrible emotional scars that she still suffers wouldn't be quite so hard to bear. It's clear that the delivery you describe was nothing like that of my friend's. It's been 16 years and it's good to see how midwifery has come on since then.

I agree that spontaneous, cheerful laughter from the end of the ward at such a sad time, could be seen as insensitive. Compare it though, to the conscious communication between my friend and her midwife! It puts a different light on it doesn't it? Anyway, I'll sign off now. Speak to you soon, T.G.

Topic: Still Birth (6 of 7), Read 92 times **Conf:** Clinical Questions
From: Student Midwife S.K..
Date: 20 February 2001 01:37 Hi all,

Thanks for your responses they were all very thoughtful and I hope you will be able to share similar experiences that you have. It helps to share thoughts and feelings. Thanks once again,
S.K. xxx

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