

Remote Remedies: Challenges When Teaching On-Line

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ABSTRACT

Many educators are experimenting with on-line learning. However there are many differences between teaching remotely/electronically compared with the classroom and laboratory, so academics have to adapt their delivery, preparation and course administration. This study shares our experience of participating in a completely remote course for both lecturers and students.

During the 1999 academic year, a first year course in Internet & Web Design was offered in traditional classroom sessions and on-line formats (1). Over the Summer School, 1999 – 2000, the course was only available on-line and consisted of exercises, course notes, self-assessment questions, and communication via bulletin board and email. Our findings are compared with those of the formats offered in the 1999 academic year.

The data for the study was collected by pre- and post- course questionnaires. Additionally, focused interviews with 3 students from a dysfunctional assignment group were conducted after the course had finished.

The issues we encountered included ones related to hardware and software, submission of assessments, student communication with each other and the lecturers, as well as student and staff motivation over the holidays.

1. INTRODUCTION

Many tertiary institutions are experimenting with on-line learning, (a web search on 19th April 2000 found 3 million references to “learning on-line” with 6450 of them in New Zealand). While this is mainly a response to the changing needs of students, institutions also expect that teaching on-line will save time, cut costs and earn revenue. Existing research documents the pitfalls of teaching on-line (4, 7) and we used these lessons to anticipate problems as we planned our on-line course. The course was modified throughout 1999 as the students discovered problems – often semantic problems with the practical exercises, which are cleared up easily in a classroom situation, but have the potential to cause major problems for remote learners. This iterative process of user testing is a necessary process in developing a completely on-line course. This study documents the problems we encountered but hadn’t anticipated.

2. THE COURSE

Internet and Web Design (IWD) is a popular first year introductory course in the Bachelor of Computing Systems degree. At first it was taught by traditional means of lectures and practicals. Then in the first Semester of 1999 we changed to a more flexible method of teaching (1). As well as classroom sessions, we offered our students the choice of working remotely; that is, working through the lecture notes and practical exercises on-line. Weekly formative self-assessment questions on-line allowed



students to access the questions and notes in the practical sessions or offsite at any time of day or night. If they had a problem they could attend a classroom session to seek specific help. The option of this flexible learning format proved to be very popular with the students.

Originally the course website was plain HTML files, except for the self-assessment questions which used the WebMCQ (2) system. Since Semester 2, 1999 we have used the WebCT (3) course building shell to host the course website. This has a self-assessment feature built in, along with many other useful tools and features.

In the 1999-2000 Summer School, the course was offered completely remotely. There were no face-to-face sessions except an introductory session, the project presentations and final exam. If students had problems they were requested to post their question on the bulletin board rather than use email so that we could: avoid duplication of lecturer responses; attempt to mirror classroom communication; allow students to answer each others' questions; provide students with experience of web-based discussions; and test the suitability of bulletin boards for on-line courses.

The introductory session was critical to the success of the course because it was the only time we saw the students until the final presentations. In this first session, all essential administrative and course details had to be covered, such as assessment details and how to contact lecturers. The students received basic training in using the course web site before testing their course website login and posting a personal introduction message on the bulletin board. This helped facilitate the process of forming the research groups by providing an opportunity for introductions.

In spite of the importance of the introductory session, three students were absent, and so we had to give them individual orientation sessions at a later date. These 3 students were formed into one research group since it was not feasible to disrupt the dynamics of groups formed during the introductory session. Internet access was a pre-requisite to the course, so we had assumed that students had basic email and browsing skills so these topics were not included. However at least 2 students had no email address so we had to oversee them creating free web mail accounts.

The Semester IWD courses span 16 weeks. This includes the 12 weeks of course content, a two-week mid Semester break, a project presentations week and a revision week. The Summer School however, only had 11 weeks available so the structure had to be condensed. This meant that it began in the same week that students were completing exams, so they never had any chance to rest

and reflect before embarking on a new course. Straight after the introductory session two of the students went to their home countries for the summer break; Poland and Malaysia. They studied from there, communicating with their assignment groups by email.

The IWD course is assessed by means of a group research report, an individual practical exercise (production of a 10 page website) and a written exam. Part of the group research report mark is attributed to email communication. There were no changes to the method of assessment for the Summer School so we are able to easily compare results from students who studied completely on-line and those who had the option of face-to-face contact.

3. STUDY METHODOLOGY

This study is part of an ongoing program of research using pre- and post- course questionnaires, which seek both qualitative and quantitative answers. For continuity, the questionnaires used the same questions as previous semesters, but additional questions relevant to the unique situation of the Summer School were added. The pre-course questionnaire determines students' age, gender, ethnicity, prior educational experience and prior experiences of the Internet. The post-course questionnaire asks for the students' experiences with on-line learning, quality of communication, and their usage and experiences of the different course materials (i.e. further readings, practical exercises, self-test questions, FAQs).

There is a difference between the total number of pre- and post- questionnaire responses for each course. Reasons for this include student drop-outs, non-attendance at the project presentation sessions when the post-questionnaire is filled out and students not filling in their names on the questionnaire. In Semester 1, 1999 (s1), there were 71 valid first questionnaires and 54 valid second questionnaires. In Semester 2, 1999 (s2), there were 90 valid first questionnaires and 63 valid second questionnaires. In the Summer School, 1999-2000 (ss), there were 27 valid first questionnaires and 19 valid second questionnaires.

4. RESULTS

4.1 On-line learning.

The first question we asked the students was why they "chose to study IWD on-line in the Summer School". Most of the responses were that they wanted to complete the degree sooner – IWD is a pre-requisite for other courses, and the students wanted to do them a semester

sooner. Other reasons included that they were eligible for student income over the summer break, or that they wanted to “keep their hand in with learning and study”.

We next asked three questions: how useful the students found on-line learning; whether they would recommend other students study the course on-line; and whether they thought more courses should be on-line.

Table 4.1.1. How useful did you find learning on-line? Students were asked to score on a scale of 1 (not useful) to 5 (very useful).

Response	99 s1	99 s2	99 ss
Scale	no. %	no. %	no. %
1	2 3.7 %	0 0.0 %	2 10.0 %
2	1 1.9 %	3 4.8 %	0 0.0 %
3	7 13.0 %	10 15.9 %	6 30.0 %
4	14 25.9 %	17 27.0 %	3 15.0 %
5	30 55.6 %	33 52.4 %	9 45.0 %
avg. (mean)	4.28 (5)	4.27 (5)	3.83 (4)

The students generally favoured on-line learning, but were not as enthusiastic about it as students in previous semesters. Semesters 1 and 2, 1999 had very similar distributions and average scores, which were significantly higher than the Summer School average. Only 2 students out of 117 gave a score of 1 in Semesters 1 and 2, 1999, and both of these students didn't have a computer at home, so obviously on-line learning wasn't useful for them. In the Summer School 2 students out of 20 gave a 1, a much larger proportion (although they may have been disgruntled due to a low research assignment mark).

Table 4.1.2. Would you recommend this course to others? (Yes/No)

Response	99 sem 1	99 sem 2	99 ss
yes	48	59	17
no	4	2	2

Table 4.1.3. Would you like to see more courses on-line? (Yes/No)

Response	99 sem 1	99 sem 2	99 ss
yes	49	55	16
no	3	4	3

The results of the two other questions, shown in Tables 4.1.2 and 4.1.3, also show that the students were very favourable to on-line learning, but not as enthusiastic

in the Summer School. The Summer School students who didn't have the choice of coming to class rated “on-line learning” less favourably than the Semester students who had that choice if they had problems.

4.2. Communication

The next set of questions asked the students to evaluate their communication, both with the lecturers and within their groups. These questions were not asked of students in previous Semesters.

4.2.1 Inter-group Communication

Table 4.2.1 How well do you think your research group communicated? Students were asked to score on a scale of 1 (very poor communication) to 5 (very good communication).

Response	No. of students
1	0
2	4
3	9
4	3
5	4

Table 4.2.1. shows the results of the question: “how well do you think your research group communicated?” The members of the groups that we thought worked well together generally gave a similar score to each other, whereas groups we identified as having problems gave a wider range of responses. For example, one group of three all gave a score of 5, while another group of three gave a 5, a 3, and the third member dropped out because of inter-group problems and refused to fill in the questionnaire.

Many of the student comments said that it was hard to communicate by email, with a major reason being the asynchronous nature of email: “When we emailed each other, response time was sometimes 2 days between” said one student. There were other similar comments.

The make-up of the groups also caused communication problems. A student from the group that included someone studying in Poland commented that communication was “difficult” but that this was “more to do with the lottery of group make-up”. Groups that already knew each other had less difficulty communicating. “As we all knew each other, there was an ease of communication”, said one student from a cohesive group.

4.2.2. Lecturer-Student Communication

Table 4.2.2. How well did you find the communication with your lecturers? Students were asked to score on a scale of 1 (very poor communication) to 5 (very good communication).

Response	No. of students
1	0
2	1
3	7
4	8
5	4

The student comments divided into two main areas. Many students were pleased with how quickly we responded to their questions, despite the lecturers' absence from campus. "All my queries were answered very quickly," said one.

Another group of students were concerned with the lack of face to face contact. Student comments included: "I like face to face communication which this does not facilitate"; "email lacked immediacy, lacking informal contact – hints etc."; "I have decided that I prefer having the choice of classroom contact so that questions can be answered at the relevant time."

4.3. Assessment Results.

Table 4.3.1. Assessment results for all students from 3 Semesters.

Average marks	99 s1	Semester 99 s2	99ss
Ass 1	62.4	58.1	59.1
Ass 2	60.3	59.7	59.1
Final Exam	65.9	63.8	61.1
Total	61.5	56.8	54.7

Table 4.3.2. Assessment results for "remote" students from 3 Semesters.

Average Marks	99 s1	Semester 99 s2	99ss
Ass 1	69.1	61.0	59.1
Ass 2	68.2	56.8	59.1
Final Exam	69.8	63.4	61.1
Total	69.0	55.4	54.7

The average assessment results in Semester 2 are lower than Semester 1, although the method of instruction

was identical. This could be because of an intake of less able students. The average assessment results for the Summer School are lower than those from both the previous Semesters. This could be because the condensed course with no breaks was more difficult for the students (refer to Section 5.1 for student comments). However the Summer School results were only slightly lower than Semester 2, 1999, but considerably lower than Semester 1, 1999. So it is not clear whether the difference is due to the effect of a completely remote condensed course or to statistical variation in the ability of the students.

5. DISCUSSION

5.1. Student Issues

One serious issue was that students were expected to study a 12 week course in only 11 weeks, plus find time for a holiday as well. Some student comments were: "The time scale over Xmas is a bit difficult – I would prefer it longer, i.e. normal Semester length", and "Very demanding getting through the 12 units of this paper, both practical and theory." Perhaps because of this there were more drop outs than normal. Reasons for students dropping out included:

- ◆ getting a job
- ◆ workload too heavy
- ◆ no computer access at home

Another issue highlighted was the lack of personal tutor-student contact (refer to section 4.2.2 for student comments). In a Semester course the on-line students have the option of attending a classroom session for personal contact with lecturers and other students. The Summer School course was unable offer this.

5.2. Staff Issues

The main problem that the lecturing staff faced was the lack of a gap between Semesters (both between Semester 2, 1999 and the Summer School, and between the Summer School and Semester 1, 2000). This meant that no time was available for lecturers to recharge their batteries or develop course materials. We undertook teaching the course as an extra to our workload, rather than a seeking a reduction elsewhere, and we felt that the remuneration we received did not reflect the associated workload. The electronic contact with students was not the burden that we expected, and most of the workload consisted of administration and marking.

One issue with WebCT was having to change over from the previous Semester, for example: changing the dates in the calendar; creating new student accounts; plus deleting the previous Semester's accounts and bulletin board messages. (WebCT is charged on the number of student accounts, so it is necessary to delete the old accounts). For this reason we could not schedule the first Summer School session until after the exams for Semester 2, 1999 because the students needed website access for revision purposes. There was also pressure to schedule the session before the overseas students returned home. The compromise we made was holding the first session the day after the final exam for Semester 2, 1999. The continuous workload for both staff and students was intensified by holding the Summer School final exam on the same day as orientation for Semester 1, 2000.

5.3 Bulletin Board Issues

Research shows that students tend not to use discussion forums unless their contributions are assessed or discussions are encouraged by the lecturers (4,6).

Despite the fact that we tried to encourage use of the bulletin board for discussion and problem solving, we found that use of the bulletin board was fairly low. Many students continued to email the lecturers rather than use the bulletin board for questions. Perhaps this was because they didn't want to appear to lose face in front of their peers, or because we didn't assess the students' contributions.

Lecturers accessed the bulletin board every other day to check for students' queries and problems. During the Christmas and New Year break, the only posts were Happy New Year messages between the lecturers, who often made special trips to cybercafes from their holiday locations in order to fulfil their commitments. The WebCT access logs showed that there were almost no student accesses of the course website in the whole holiday period.

5.4 Assignment Submission Issues

In usual Semester courses, assignments are submitted as hardcopy. In the Summer School, all assignments were submitted electronically and the lecturers printed them out to mark them. We actually scheduled our holidays to fit in with assignment submission dates. The rules for submission were that assignments had to be in particular file formats, and mailed to a specific email address with a standard cover sheet.

A number of unexpected problems transpired with this process:

- ◆ The students didn't email the assignments to the correct address. Some students emailed to more than one address just to be sure (either home and work emails, or to multiple lecturers).
- ◆ The lecturers had to print out the assignments. This was a significant administrative burden for us, and it also transferred the cost of paper and printing from students to the polytechnic.
- ◆ The assignments often had unnecessarily large file-sizes (e.g. one storyboard Word Document was 3.5Mb which lead to a 5.1Mb email attachment!). This resulted in large delays in opening mail messages and printing out assignments.
- ◆ Some of the students' peer assessment forms went missing – some students didn't use the correct email address. When students had 10% deducted for not submitting a peer assessment form, they complained that they had sent it. It is therefore imperative we develop a confirmation of receipt system.
- ◆ One lecturer caught a virus on her home machine from an assignment that was submitted to both home and work. The virus protection software at UNITEC dealt with the virus successfully, but at home it required time downloading and installing software updates.

5.5 Group Work Issues

Generally, students find it difficult to work in groups, especially if they don't know each other (see section 4.2.). This is even more difficult when face to face meetings are not possible. As one student commented "team projects are harder to co-ordinate over Xmas and on-line". During a Semester course it is easier to identify problems with group dynamics and deal with them before they escalate. However, in a completely on-line course there is a degree of remoteness exacerbated by having to use the printed word rather than face-to-face interaction where tone of voice, facial expression and body language combine with what is said to make a message complete. The condensed timescale of the course made this even more of an issue.

These reasons may explain why one of the groups had a serious breakdown in communication, which resulted in one of the students becoming so upset that she didn't want to complete the course. All quotes in the following case study are from interviews held with the students or emails received from the students. One of our syndicate groups involved two articulate young women (K and L) and one headstrong young man with English as a second language (B). K returned to study from work in industry where she had team experience and was aware "that the

purpose of this assignment was to get us to work as a team”.

Both women found it increasingly difficult to work with B. They reported later that they had “difficulty getting B to listen and use proper research methodology”. K said later that she’d never “had to work with anyone quite as unmotivated, spiteful and especially unable to think for themselves” as B, whereas L said that he “wore her out”. According to emails between the women, they were concerned as late as Jan 5th [assignment due 14th] that B did not fully understand the topic. During an abusive phone call from B to K, K told him that the search material he had sent was “off topic”. He retorted that “she was too fussy”. The problems continued when B supplied his second attempt as his part of the research. K realised straight away that the work was downloaded and “immediately went to one of his sites and confirmed it.” The report she wrote later gives a graphic account of the problems K faced:

“I went straight back to him to ask if he knew what plagiarism was. He didn’t, so I explained it to him and told him it was against all the rules and that I was sorry but we couldn’t include it or we would be marked down and that if I’d picked it up straight away, the lecturers definitely would. I explained that I wasn’t picking on him and that I just wanted good marks. He was not happy, saying he got the information from sites himself, so it was his work and wasn’t plagiarised. I had to explain once again that he couldn’t just cut and paste things and hand it in as being his own work, he had to investigate things himself and write his findings, or at the very least re-word things to make them his own.”

The assignment was finally completed on time, mostly due to K and L, with L admitting that she heaved a “sigh of relief that it was over”. Unfortunately in the Peer Review she only marked B down by 5 marks while K marked him down by 60 marks. This meant that we were only able to reduce his mark by 10%. When B discovered his mark was reduced he made abusive phone calls to K and L.

As our course continues, normally the “critical friendships” (5) formed by syndicates extend to the practical component so that the students support each other while preparing their web sites. This is critical in a remote only class. After the research assignment was submitted there was no further contact between the group members. They were behind with the web page development and tried to solve their practical problems alone. It appears that both women had lost confidence, the constant bickering having taken its toll.

When it came to publishing their web pages, K, L and B, like many of the other students, found using FTP a challenge. Normally in a Semester course they would have asked for help from the lecturers or attended a session to help them through this glitch. K spent so much time trying to get FTP to work that she found herself with a day left to finish her site and place it on the our Web server. When she finally phoned us, we suggested that she bring her work in and we would help her upload it. By this time frustration had taken its toll and her enthusiasm for the course had gone. She supplied an unfinished set of pages for which she received a poor mark. L also needed help with FTP but she managed to supply web pages that just passed. B’s solution to his difficulty downloading and using a free FTP client was to break into a computer lab on campus through a skylight window. When he was caught red handed his explanation was that he “needed a computer with an FTP connection!”

With encouragement from the lecturers all three students sat the final exam. L & B scored bare passes and K scribbled all over the paper and failed. When interviewed later she said that even “being in the same room as him” reminded her of the trauma of being abused by email and telephone and could not concentrate on the exam. However K is re-doing the course this semester and is working well.

6. CONCLUSIONS

In general the online internet and web design course was a success, allowing 21 students to fast-track through the degree. The students had a generally favourable impression of on-line learning, but with reservations about the lack of personal contact and the high workload due to the collapsed course timescale.

Perhaps success was partly due to the fact that we anticipated a lot of possible problems and devised strategies to deal with them. These strategies included:

- ◆ pre-warning the students about motivation, the limited support from the lecturers, and the need to support each other on-line.
- ◆ hardware and software requirements
- ◆ reminder emails to keep the motivation level of the students high,
- ◆ assignment submission file format and email address instructions,
- ◆ using the bulletin board for student questions rather than email
- ◆ splitting up the marking and student support workload.

However there were a lot of unexpected problems.

- ◆ There were more inter-group problems than a normal Semester course and they tended to be more severe. It is important to spend time forming project groups, to let the students get to know each other's skill-set and interests to help avoid problems. This is perhaps even more important in a fully on-line course.
- ◆ The drop-out rate was higher than normal, impacting on other group members. It is also more difficult to reform groups electronically. If a course is to be condensed, then the difficulty of the course needs to be stressed to the students at the beginning.
- ◆ Despite our instructions the students emailed the assignments to the wrong address or to multiple addresses. The administrative burden on the lecturers also proved to be heavy. We recommend that polytechnics that intend to allow on-line submission of assignments have an administrative email account (e.g. assignments@disc.unitec.ac.nz) or an electronic drop-box. Administrative staff would manage the procedure of receiving, printing and confirming receipt.
- ◆ There were a lot of practical problems with the publishing of student websites using FTP. The students had to download and install an FTP client, and then connect to our web server. In normal classroom sessions we have noted that the whole process is very intimidating for students with no previous FTP experience, and that a lot of problems occur which are easily solved face-to-face. On reflection our instructions were not as understandable as they could have been. Perhaps we should have had a classroom FTP tutorial session towards the end of the Summer School.
- ◆ Despite our instructions there was a lack of bulletin board activity. In Semester 1, 2000 we decided to experiment with attributing research assignment marks to bulletin board use, setting up private discussion forums for each group.

To make your on-line course successful it is important to anticipate all possible challenges and devise strategies to remedy them and carry out user-testing to identify problems.

7. ACKNOWLEDGEMENTS

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