# **SOLE** Case Study Series


## Information and Computer Sciences

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**Funded by Learning and Teaching Support Network & JISC**

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# Contents

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## Executive Summary

This report analyses and summarises the results of two case studies into the use of Virtual Learning Environments (VLEs) in first year Information and Computing Sciences (ICS) within two different UK universities. The survey was conducted by the Learning and Teaching Support Network (LTSN) Subject Centre for Information and Computing Sciences (LTSN-ICS) as part of the SOLE (Students' Online Learning Experiences) project.

**Purpose of the Study**

SOLE is a collaborative project funded via Tranche 2 funding of the LTSN (and provided by the Higher Education Funding Council for England (HEFCE)) and the Joint Information Systems Committee (JISC). The project, led by LTSN Economics at the University of Bristol in collaboration with 4 other LTSN Subject Centres, carried out an independent evaluation of students' first time usage of of VLEs in further and higher education. The study aimed to establish the effectiveness of VLEs in supporting student learning across a number of different discipline areas and in different learning situations.

**Background**

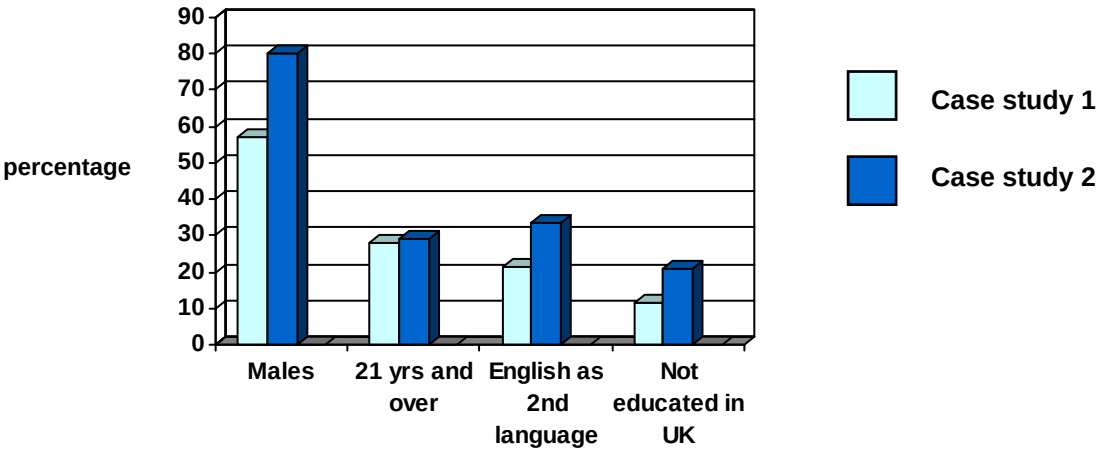
The study methodology was based upon the evaluation framework set out in the handbook for learner-centered evaluation of computer facilitated learning projects in higher education (Philips et al., 2000). Several aspects of the research has drawn on the Critical Incident Technique pioneered by Lockwood (Gilbert and Lockwood, 1999).The approach is designed to provide an in-depth set of case studies based on course modules across a range of subjects, with a wide range of data and collection methods. The main elements we have used, assuming a 10 week unit, are as follows:

- Student diaries (weeks 3 and 8)
- Transaction logging (throughout)
- Recording of transactions (throughout)
- Interview with tutor (weeks 1 and 9)
- Interview with students (week 9)

**Profile of Participants**

85 students out of a potential 233 completed questionnaire 1 which aimed to establish the profile of the cohort including gender, age, first language and country of secondary education. The results are indicated below.

**Figure 1 Percentage profile of participants for both case studies**




## Learning models

Both case studies were carried out during the second semester of the 2002/03 academic year (12 weeks from February through to June 2003). Both case studies were carried out with year 1 students on full-time courses at 'new' universities. In each case the module under investigation was a compulsory module. The VLE used in case study 1 was WebCT and StudyNet in case study 2.

Case study 1 looks at a foundation module which aims to support all students in acquiring the core skills needed to study at degree level. It brings together study skills, IT and self motivation. There is a strong emphasis on group working and presentation skills as well as finding information and citation. Through short assignments, students are encouraged to reflect on their learning needs, build up a portfolio of evidence of the skills acquired and plan for their personal development in subsequent years.

Case study 2 focuses on a module where students learn some important theoretical ideas by using formal systems in the design of simple programs. An important strand of activity is the guided study, where students work through module texts, carry out paper-based exercises and use computer systems to explore the application of the theoretical ideas. This activity is supported by the supervised practical/workshop sessions and also through a structured approach to the provision of worked solutions and self-assessment exercises firmly rooted within the VLE which also hosts discussion groups and feedback mechanisms, to ensure that students have opportunities to communicate both with their peers and the module teaching staff.

## Embedding the VLE

In both case studies the VLE was used primarily to provide students with access to information and to assist discussion and communication, a move which was in general appreciated by the students.

### Case Study 1

The tutor was trying to encourage learning by doing as this is essentially a skills based module. Students cover group dynamics and have to do a group exercise and a presentation in groups. Using the VLE tutors have found it easier to administer the group work elements of this module. Integrating WebCT has also enabled the tutors to change the assessment, and a portfolio is now used. The tutors intended approach in using the VLE was to get the students to interact more and this has been successful.

### Case Study 2

In this instance the VLE was used throughout the academic year for all their courses to a greater or lesser extent. Within the module under observation, the VLE was used as an organisational tool for delivery and allowing access to notes 24 hours a day. One interesting development was that tutors put up hand written versions (of solutions) which allowed them to see how the solutions were developed. The VLE had no multiple choice question facility, so it was impossible to provide formative, continuous assessment.

## Student Preparedness

### Case Study 1

WebCT is used in other modules in the first year so most students had encountered it prior to starting this module. Respondents were generally confident about using the internet. Confidence in working and learning online was slightly lower. There was a further reduction in levels of confidence in finding their way around WebCT. Not surprisingly for information science students very few students reported little confidence in any of these areas with no student recording no confidence.

**Case Study 2**

As with Case Study 1, StudyNet is used across the board on all first year courses, where it is mandatory. Despite this background, fewer than one third of respondents had used StudyNet prior to the start of the module, although the majority of those who had used it before had significant experience. Given that students were enrolled on a computing course it is no surprise that all respondents were confident about using the internet and needed little support. All students recorded at least some confidence in finding their way around WebCT and in obtaining information via the system. Students were considerably more reticent about taking part in online discussions underlining the fact that students of computing typically have limited exposure to innovative teaching and learning methods.

**Motivation**

In both cases students motivation levels were positively influenced by use of the VLE in comparison to other modes of learning. In particular working online helped them to feel part of a group.

**Case Study 1**

Part of the rationale behind this module is aimed at improving student confidence and making them more independent learners. However as students become more strategic in their learning patterns, they will only engage with an activity if it contributes towards their assessment mark. Developing a portfolio as part of the assessment seems to have improved motivation, as has diversity of activity and working in pairs.

All students were enthusiastic about this new way of learning, commenting particularly on its interactive nature. Despite low expectations at the beginning for most it had been a very positive experience, resulting in increased confidence and students were definitely more motivated and enthusiastic as a result. Students recorded no negative experiences in using the VLE and found it more useful than traditional chalk and talk.

The vast majority of students (89.9%) are motivated by getting good marks in the assignment. Only 57.6% indicate that they are interested in the subject matter of the module, with 25.4% indicating that they were only undertaking the module to gain credits. More than half (54.3%) were doing the module to help them achieve their personal goals.

**Case Study 2**

The vast majority of students (87.5%) are motivated by getting good marks in the assignment, 66.6% of respondents indicate that they are interested in the subject matter of the module, with 25% indicating that they were only undertaking the module to gain credits. Just over half of the respondents (54.2%) felt they were good at the subject and expected to do well. More than half (58.3%) were doing the module to help them achieve their personal goals.

One of the big benefits of using StudyNet on this module was observed in the discussion groups.

**Student and tutor roles**

**Case Study 1**

The use of online learning was well received by the students and the approach considered successful by staff. There were three tutors involved who worked as a team. One tutor checked more or less daily to see what had happened. Interviews with students revealed a definite need for tutor interaction which provided an informative source of support as the tutor encourages discussions. However, students were split in their opinions as to whether the VLE promoted self-directed learning. The bulletin board was used to post/manage responses to each other and the tutor and most students felt that they had learnt from their fellow students. In particular there were positive comments regarding quick access to other students and an instant response to queries.

The tutor role is really one of minor facilitation, although there has been some management of the discussions and some student tracking. The tracking tools revealed the need for early identification of non-participation and some incentives in the form of marks, e.g. for completing quizzes. Whilst tutors

believe that the VLE is suitable for delivery on certain types of information and knowledge there is concern from both students and tutors that the tutor may become too remote.

**Case Study 2**

From a tutor point of view, the best aspect of StudyNet was reported to be the organisation of teaching staff and one tutor felt that the administrative load was genuinely reduced.

Tutors using StudyNet mainly to distribute notes with use of the bulletin board for students to get help either from tutors or from their peers. This provides students with an opportunity to reflect on the material. Students have also become experienced at providing peer support and discussions are only lightly moderated.

Although StudyNet has no monitoring capabilities, it has to some extent helped with student support. However tutors raise concerns over raised expectations and the fact that students expect notes to be there and expect responses to queries.

# 1. Introduction

The Students Online Learning Experiences (SOLE) project is an independent evaluation of students' usage of virtual learning environments (VLEs) in higher and further education funded by the Higher Education Funding Council for England (HEFCE) via the Learning and Teaching Support Network (LTSN) Tranche 2 funding and the Joint Information Systems Committee (JISC). The project aims to draw out the effectiveness of VLEs in supporting different subject areas. This report details the findings of the Information and Computer Science study.

To date, research concerning the evaluation, support and use of VLE's has focussed on staff rather than learners. The pedagogical focus of VLE use from a student's perspective remains relatively under-researched both generically and at a subject level.

This study collects evidence on student attitudes to, and usage of, VLEs. The research methods have been designed to identify initial difficulties and track those difficulties which remain as students gain experience with the system.

# 2. Purpose of the study

The purpose of this study is to undertake an independent evaluation of the usage of virtual learning environments by two Information and Computer Science (ICS) departments within UK higher education institutions in order to draw out the effectiveness of VLEs in supporting the subject, current national agendas and student learning. When collated with a further 8 case studies (2 each from 4 different disciplines) the combined Research Objectives are*:*

1. To identify some aspects of the processes and strategies of learning (intended and unintended) that are associated with VLEs, both with subject area and generically.
2. To identify any specific changes in student attitudes to their learning, motivation or adaptation to VLEs by contrasting first time use with more experienced use throughout the period of a course.
3. To establish a cross-disciplinary evidence base on how VLEs can support learning and contribute to our understanding of the factors that may influence successful teaching and learning strategies.
4. To identify and investigate any unintended findings or outcomes where they emerge.

# 3. Background

ICS is a diverse and highly dynamic subject area, the shelf life of curricula and learning materials is extremely limited by the rapidly changing nature of the ***subject,*** making computing science and technology-related areas of information science very volatile in terms of resources. Clearly, ICS education relies heavily on currency of information and many areas are developing almost day by day, both curriculum and resources need to be continuously updated. The complexity of the discipline is further exacerbated by the overlap with other disciplines, creating new interdisciplinary topics (e.g. multimedia technologies). Furthermore, the route to undergraduate study in the ICS disciplines is diverse. In most cases there are no subject specific entry requirements for students enrolling on programmes; students are recruited on merit, from a diverse variety of academic backgrounds, thus resulting in large groups of mixed ability and diverse learning experiences.

Teaching large numbers of mixed ability students presents a significant problem in terms of assessment, feedback and group work activities. Today's employers have expressed a need for graduates to improve their group working and communication skills. With increasing student numbers, the ability to co-ordinate and manage group projects is a laborious task. Assessment is an area of great concern for ICS academics. With large student numbers, the task of setting regular assignments and providing timely, formative feedback is an onerous one.

"Widening participation" is a key priority on the national HE policy agenda and a cornerstone of activity in relation to most HEIs who need to be at the forefront of initiatives such as the provision of part-time learning opportunities and the increasing emphasis on e-learning. HEFCE 2002/52: Performance Indicators in higher education (http://www.hefce.ac.uk/Learning/perfind/2002/) indicate that as a discipline mathematical and computer sciences is well above the national average recruiting 30% of entrants from social classes IIIM, IV and V (although this is still under-representative of this sector of the population as a whole). Statistics also show that there are disproportionately small

numbers of women in academic computer science. Many researchers feel that women are uncomfortable with the computer culture, which emphasises almost obsessive, highly focused behaviour as the key to success. Other studies note that the expectations and stereotypes of software designers are at the root of the male bias in software (Frenkel, 1990) coupled with a 'macho' culture among students and some lecturers which discourages some women students. Interestingly, disproportionately low female participation is not a worldwide phenomenon.

In recent years, the computing discipline has been at the forefront of the increasing participation agenda. HESA statistics indicate a 61% increase from 1996/97 to 2001/02. The sharp rise in student recruitment has inevitably led to problems in providing and sustaining adequate student resources and support. Whilst most departments were aware of the need to widen student access and increase flexibility in curricular delivery, there is still a considerable amount of pedestrian teaching which results in diminished learning opportunities, lack of individual academic support and inadequate opportunities for independent learning. Within ICS departments, technology is readily available but its use to support learning and assessment is still rather limited despite the fact that it has been shown to provide demonstrable benefits.

As participation in ICS programmes continues to expand, the disciplines have witnessed a corresponding increase in attrition rates, supporting and retaining large student numbers (with limited resource) is a widespread problem. With an increase in the number of part-time, distance and life-long learners in the ICS disciplines, the interest in technology to support this expanding group of students with diverse learning needs and e-learning as a route to relevant and vocationally strong courses that have in-built flexibility and choice is now growing rapidly.

e-learning and the allure of online provision is viewed by many as central to addressing the "widening participation" agenda. For ICS academics, the technological implementation presents no particular difficulties. However, it is widely acknowledged that the pedagogical paradigm shift from classroom based provision to online facilitation is a significant challenge. Academic staff and students both need to learn new skills to move from traditional to e-tutoring mode in order to take full advantage of these emerging technologies.

## 4. Methodology

This report analyses and summarises the results of two case studies into the use of Virtual Learning Environments (VLEs) in first year Information and Computing Sciences (ICS) within two different UK universities.

The project used the evaluation framework set out in the handbook for learner-centered evaluation of computer facilitated learning projects in higher education (Philips et al., 2000). Several aspects of the research also drew on the Critical Incident Technique pioneered by Lockwood (Gilbert and Lockwood, 1999).

The approach was designed to provide an in-depth set of case studies based on course modules across a range of subjects, with a wide range of data and collection methods. The main elements used were as follows:

- Student questionnaires (weeks 1 and 9)
- Student diaries (weeks 3 and 8)
- Transaction logging (throughout)
- Recording of interactions (throughout)
- Interviews with tutor (weeks 1 and 9)
- Interview with students (week 9)

The key research questions are as follows:

- What is the implicit learning model, what is the explicit learning model and what is the actual tutor and student behaviour? How far is the VLE embedded within the pedagogical model and actual teaching and learning activities?

- What factors do students identify as affecting their motivation positively or negatively? Can any of these be attributed to the VLE itself?

- How much time (online and offline) do students spend working on VLE modules?

- What resources are the students making use of? What patterns of use can be identified?

- How do students use the VLE toolkit? (Which elements? including assessment tools and feedback mechanisms). (Implied model/actual model; interactions, differences; factors affecting these)

- How do students choose to communicate (how? when? why?) and for what purposes? How do the VLE tools support this?

- Who is/what is the role of the tutor? What is the role of the student? How do these relate to the implicit, explicit, actual model of learning? And to student participation in the VLE?

- Are we able to identify issues around authority (of knowledge; of expertise; teacher-student communications) in relation to VLEs?

- How do students and tutors use and perceive the various forms of support available. How important do tutors think support is and what is their understanding of student preferences?

In order to analyse the student's diaries, we developed a taxonomy based on the works of Bloom (1956) and Anderson & Krathwohl (2001).

All respondents completed questionnaires, these included questions on student characteristics, preparedness, motivation and attitudes towards using the VLE. The first questionnaire was administered at the beginning of the semester and the second towards the end of the semester. All students were also asked to complete diaries of their activities during two separate weeks of the module, one at the beginning of the semester and one towards the end of the semester. A small number of students were interviewed at the end of the semester. Course tutors for both modules were interviewed at the beginning and end of the semester.

At the beginning of the semester, students were given information regarding the SOLE project during their first lecture. The researchers gave a talk on the background of the project and the study procedure. Each student received a pack containing consent forms, two questionnaires, two student diary forms and a timetable of activities. Each pack was identified with a unique tracking number. Students were informed that their identity would remain anonymous and they could opt out of the study at any time.

The ICS case studies were completed between February and June 2003. The methods used were in accordance with those followed by the other project members. At both case study sites the first questionnaire was distributed and collected at the beginning of the first lecture. Case study 1 students returned 61 completed questionnaires, a response rate of 49%. Case study 2 students returned 24 completed questionnaires, a response rate of 22%. Similarly the second questionnaire was distributed and collected at the beginning of a lecture towards the end of the module. Case study 1 students returned 27 completed questionnaires, a response rate of 19%. Case study 2 students returned 25 completed questionnaires, a response rate of 23%. While every effort was made to encourage participants to complete both questionnaires, many participants completed only one. Table1 shows the breakdown of responses from each case study.

| Description | Case Study 1 | | Case Study 2 | |
|---|---|---|---|---|
| **No. enrolled on module** | **125** | | **108** | |
| **Responses** | | | | |
| **Questionnaire 1** | 61 | (49%) | 24 | (22%) |
| **Questionnaire 2** | 27 | (19%) | 25 | (23%) |
| **Q1 matches Q2** | 27 | | 24 | |
| **Diary 1** | 4 | (3%) | 0 | (0%) |
| **Diary 2** | 1 | (1%) | 0 | (0%) |
| **Diary 1 matches Diary 2** | 1 | | 0 | |
| **Teacher Interview 1** | 3 | | 2 | |
| **Teacher Interview 2** | 3 | | 2 | |
| **Student Interview** | 4 | (3%) | 0 | (0%) |

**Table1: Responses from Case Studies**

All students were asked to complete diaries of their activities relating to VLE during weeks 3 and 9/10. Although course tutors reminded students verbally and via the message boards at both institutions, and reminders were emailed to each student by the researcher during weeks 2 and 8/9, case study 1 students returned only four completed diary 1 and no diaries were returned from case study 2. Only one diary 2 was completed by a student from case study 1.

Four students (of varying ability) from case study 1 volunteered to take part in 30 minute, semi-structured interviews regarding their experiences of the module. Unfortunately the tapes were of very poor quality and could not be transcribed. The interviewer made notes during the discussions and some observations made in this report are based on these. No student from case study 2 agreed to take part in an interview.

# 5. Profile of participants

Data has been collected from two first year Information and Computer Science modules, both taught at 'new universities' in England.

**Case Study 1**

Participants of case study 1 were first year undergraduates taking a Learning, Communication and Technology (LCT) module incorporating WebCT. Of the 125 students registered to take this module, 61 students, 26 females and 35 males, completed questionnaire 1 at the beginning of the module. Six respondents were studying part-time. 24 participants also completed questionnaire 2. Only four students completed diaries at the beginning of the module; one of these students also completed a diary towards the end of the module. Three tutors were interviewed, both at the beginning and towards the end of the module. Four students were interviewed towards the end of the module. Of the 61 participants, 52 students were educated in England, six in China, one in France, one in Nigeria and one in Scotland. 48 respondents have English as their first language.

**Case Study 2**

Case study 2 participants were first year undergraduates taking a Formal Systems module incorporating StudyNet. A total of 108 full-time students registered to take this module. At the beginning of the module 24 students, 5 females and 19 males, completed questionnaire 1. All 24 respondents plus one other student completed questionnaire 2. No diaries were completed by students. Two tutors were interviewed, both at the beginning and towards the end of the module. There were no students interviewed. Of the initial 24 respondents, 19 were educated in England; four in China and one in Israel; 16 students have English as their first language.

**Combined data set**

The combined data set for questionnaire 1 comprises 85 students, of these 51 are male and 31 female. The gender breakdown across the two case studies is as follows:

| Gender | Case 1 (%) | Case 2 (%) | Overall (%) |
|---|---|---|---|
| Male | 57 | 80 | 64 |
| Female | 43 | 20 | 36 |

**Table 2: Percentage of respondents to questionnaire 1 by gender**

The higher proportion of females in case study 1 reflects the fact that students studying this module have enrolled on a course which falls within the general area of 'librarianship and information science'. In case study 2, students have enrolled on a course which falls under the category of 'computing science'. The most recent HESA statistics (2001/02) indicate 61% of female participation in LIS and 25% in computing. Females are therefore slightly underrepresented in this sample.

The age range of the sample population is as follows:

| Age | Case 1 (%) | Case 2 (%) | Overall (%) |
|---|---|---|---|
| <18 | 1.6 | 0 | 1.2 |
| 18-21 | 70.5 | 70.8 | 70.6 |
| 22-40 | 24.6 | 0 | 25.9 |
| >41 | 3.3 | 29.2 | 2.4 |

**Table 3: Percentage of respondents to questionnaire 1 by age**

Although at first site, the number of mature students may seem disproportionately high, HESA statistics (2000) indicates that only 37% of students studying ICS are under 21, with the same number (37%) aged over 25 on entry.

| Age | % |
|---|---|
| Under 21 | 37.21% |
| 21 - 24 | 25.94% |
| 25 - 30 | 12.98% |
| 30+ | 23.88% |

**Table 4: HESA Statistics for ICS disciplines by age (2000/01)**

Of particular interest is the fact that almost 30% of respondents in Case 2 are over the age of 40. Computing is a popular discipline for those who decide to enter higher education as mature students as it is perceived to enhance overall employability, adding new and complementary skills to those already gained in the workplace.

The country of secondary education and first language of the sample are as follows:

| Country of secondary education | Case 1 (%) | Case 2 (%) | Overall (%) |
|---|---|---|---|
| UK | 86.9 | 79.2 | 85.9 |
| China | 9.8 | 16.7 | 10.6 |
| France | 1.6 | 0 | 1.2 |
| Nigeria | 1.6 | 0 | 1.2 |
| Israel | 0 | 4.2 | 1.2 |

**Table 5: Percentage of respondents to questionnaire 1 by country of secondary education**

| First Language | Case 1 (%) | Case 2 (%) | Overall (%) |
|---|---|---|---|
| English | 78.8 | 66.7 | 75.3 |
| Bangla | 1.9 | 0.0 | 1.3 |
| Chinese | 9.7 | 16.7 | 11.7 |
| French | 1.9 | 0.0 | 1.3 |
| Gujarati | 1.9 | 4.2 | 2.6 |
| Hebrew | 0.0 | 4.2 | 1.3 |
| Punjabi | 3.9 | 0.0 | 2.6 |
| Turkish | 0.0 | 4.2 | 1.3 |
| Urdu | 1.9 | 4.2 | 2.6 |

**Table 6: Percentage of respondents to questionnaire 1 by first language**

The vast majority (86%) of students had received their secondary education in UK so it is no surprise that 75% had English as a first language. In both cases the majority of students who were not UK domiciles were educated in China. This is fairly representative of the ICS disciplines, HESA statistics for 2001/02 indicate that the ICS disciplines attract considerable more students from overseas than from other EU countries.

| Discipline | UK Domicile (%) | Other EU (%) | Other overseas (%) |
|---|---|---|---|
| Computing Science | 86.3 | 3.9 | 9.8 |
| Information and Library Management | 87.3 | 5.3 | 7.4 |

**Table 7: HESA Statistics for ICS disciplines by domicile (2000/01)**

Case 2 represents a slightly more diverse population than case 1. However, given that both institutions have a reputation for attracting students from diverse backgrounds, the spread of cultural diversity is perhaps surprisingly limited.

# 6. Learning models

**Case study 1**

The Learning, Communication and Technology (LCT) module aims to support all students in acquiring the core skills needed to study at degree level. The module (which involves 3 members of staff) has evolved over time, for various reasons, but has been in its present form for two years.

> *"Learning communication and technology evolved out of previous units and brought together essentially study skills, a little bit of IT background and students being able to use technology. It also included some sort of self awareness and self motivating toolbox, so it covers things as well as general study skills – how to write essays, note taking, report writing, that kind of*

*thing, studying for exams. It also includes things like self confidence issues, handling stress, assertiveness, working in groups …. so developing a whole range of skills that we think first year students could usefully have to take them through to the second and third year."* (tutor – 1st interview)

*"Really what we are trying to do is get students equipped with the basic skills they need for doing this course. One of the things they are very poor at is writing skills and that's why there is quite an emphasis on it in the assessment….. although their internet skills are good, finding information is something that they take a very simplistic approach to."* (tutor – 1st interview)

In previous years the module was assessed by examination but this year the assessment has changed completely. Through short assignments, students are encouraged to reflect on their learning needs, build up a portfolio of evidence of the skills acquired and plan for their personal development in subsequent years.

*"We're sending a signal that students need to be able to learn themselves. That we can direct them to information and to ways of doing things, but that they need to do the work as well. That's the whole reason for the portfolio approach. …. I try to see it as a competence unit rather than a pass or fail academically. There is an academic element to it but we're attempting to get them to a skilled level in a range of areas…..we're trying to get them to a level where there all happy to go to the second and third year."* (tutor - 1st interview)

| | |
|---|---|
| Module name | Learning, Communication and Technology (LCT) |
| Length | 20 weeks (2 terms) |
| Credits | 20 |
| VLE | WebCT |
| Learning outcomes | On completion of this unit, the student will:<br>• be able to demonstrate that they have the skills necessary for learning in the Higher Education environment;<br>• demonstrate effective time management<br>• demonstrate effective communication and interpersonal skills;<br>• provide evidence that they have developed basic skills in the use of Information and Communication Technology |
| Curriculum outline | *Learning skills*: Reading, note-taking, information finding, library use and use of electronic information sources. Learning techniques and styles. Report and essay preparation. Numeracy. Examination techniques.<br>*Communication skills*: Time and task management – planning and organisation, self appraisal and evaluation. Assertiveness. Stress management. Interpersonal and communication skills. Group processes and skills: team building, leadership. Presentation skills.<br>*ICT skills*: Managing files, word processing, spreadsheets, databases, presentation software. |
| Teaching and Learning Methods | Mixture of lectures and seminar sessions. A variety of strategies were used including formal lectures, videos, online sessions (including the use of WebCT), guest speakers, group work, case studies, practical exercises. |
| Assessment | Portfolio to include evidence relating to learning outcomes 1-4 |

**Table 8: Case study 1 outline**

**Case Study 2**

This module is not primarily theoretical, but is one where students learn some important theoretical ideas by using formal systems in the design of simple programs. An important strand of activity, therefore, is the guided study, where students work through module texts, carry out paper-based exercises and use computer systems to explore the application of the theoretical ideas. This activity is supported by the supervised practical/workshop sessions and also through a structured approach to the provision of worked solutions and self-assessment exercises firmly rooted within the University's Managed Learning Environment (MLE). The MLE also hosts discussion groups and feedback mechanisms, to ensure that students have opportunities to communicate both with their peers and the module teaching staff. There are 5 members of staff involved, 3 do the lectures, 2 the back room support.

The primary objective is to:

> *"understand formal systems and the role of formal systems in computer science – that is the official learning objective, but the behind the scenes one is really to build student confidence in handling formal modes – trying to teach them mathematics from a different direction."* (tutor - 1st interview)

The history and evolution of this module goes back a long way:

> *"Right at the beginning of my time here, probably 20 odd years ago, they started teaching Discrete Maths and really this is a sort of Discrete Maths module on the degree that has always been there. It has been through several evolutions over the last 20 years and I came back to it last year ….it is really a long standing course that we have just recently turned round again "* (tutor – 2nd interview)

| | |
|---|---|
| Module name | Formal Systems |
| Length | Two twelve week semesters |
| Credits | 30 |
| VLE | StudyNet using Lotus Notes |
| Aims | • develop confidence in formal and mathematical modes of discourse<br>• experience a range of formalisms useful in the design of programmed systems<br>• appreciate the relationships between mathematics, formal (symbolic) reasoning and programmed systems |
| Learning Outcomes | Knowledge and Understanding:<br>• the properties of formal systems in general, and a more detailed understanding of some formal systems used by Computer Scientists in the design of programmed systems.<br><br>Skills and Attributes:<br>• manipulate the sentences of simple formalisms both manually and in an automated form<br>• use simple formalisms to represent and reason about aspects of a programmed system |
| Teaching and Learning Methods | Lectures, guided study, supervised practical/workshop sessions, MLE (worked solutions and self-assessment exercises, discussion groups and feedback mechanisms). |
| Assessment | 30% in-course tests 70% final examination A Pass overall is required. |

**Table 9: Case study 2 outline**

# 7. Embedding the VLE within the pedagogy

Access statistics together with email and online discussion communications were collected from the VLE (case study 1 only). 3 students (all from case study 1) filled in student diaries. This information, together with tutor and student interviews provides a picture of how the VLE was embedded in the pedagogy in each case.

**Case Study 1**

This is the first time that WebCT has been used in the delivery of the LCT module. Its main success is considered to be the variety and diversification which it enables, *"a different mode of learning"*. Part of the rationale for the LCT module is to prepare students for their higher education experience so it has been useful to have another medium. Nevertheless, there are real issues surrounding how appropriate it is for delivery,

*"a lot of people see it as being a very useful semi-interactive tool in a number of ways, but perhaps it isn't suitable for delivery for all kinds of courses".* (tutor – 2nd interview)

The LCT module is very much:

*"practice based… I think we're trying to do as much learning by doing really as possible because it is skills ….we've done stuff about group dynamics, we make them do a group exercise" and "they have to do a presentation in groups of two."* (tutor – 1st interview)

Using WebCT, tutors have found it easier to administer the group work elements of this module, students:

*"submit to a central source their choice of topics…… so that we can see transaction dates, and so that they can see what topics are available within their groups."* (tutor – 2nd interview)

It is time consuming to think how you can use the resource appropriately:

*"We have used it to set up the presentations which are assessed and we've used it for these citations. But there's other things you could include, exercises, the seminar which goes with every lecture, so there's quite a few areas where we could use WebCT to help collaborative efforts."* (tutor – 2nd interview)

*"Bibliographic citations are something that the external examiners picked up on regularly over the years …. so using WebCT seems to be a good approach".* (tutor – 2nd interview)

Overall VLE activities recorded included contact with tutors, access to notes, exercises, tutorial, chat room, quiz, test, assessment, online help, e-mail, posting messages to and checking discussion board. Some tasks were common to all students.

*"They've all done their PowerPoint presentations and discussions, using email first of all to input into their group, then they were to ask a question to the group and respond if they wanted to. They all did their citation testing and their quizzes."* (tutor – 2nd interview)

Integrating WebCT has also enabled the tutors to change the assessment:

*"this is the first year that we have had a portfolio for assessment, so out of this first year will come some information that might make us change some of the content of what we teach, and some of the marks awarded for the elements of the assessment."* (tutor – 2nd interview)

The tutors intended approach was to get the students to interact more and this has been successful:

*"the main traffic on it has been the presentations that looks impressive. … one of the others things we make them do, was to submit a question…. they will normally never ask another student a question. …they can compose the questions in their own time ….we only assess the submission of the question not the response, so they can respond or not and some of the responses have ended up in a conversation……. next year it would be nice to actually say you need to answer these questions as well. Just a little pressure to come up with answers. Some are doing it already."* (tutor – 2nd interview)

Diaries and interviews revealed that threaded discussions via the bulletin board; citation tutorial; quizzes and external links were the most frequently used features. Tutorials were noted to be particularly informative and online discussions were felt to be a good way to learn. At interview, each student was asked about their learning experiences using the VLE, most felt that it was a welcome addition that suited the purpose for which it was intended. All students interviewed agreed that having everything for the module available in one place was beneficial.

Table 10 illustrates student use of WebCT for accessing information and to read and post articles on the bulletin board. Of the 61 students who participated in this study, 4 did not use the WebCT system at all. A further 8 used WebCT to access materials but did not use the discussion board. 11 students read articles posted to the discussion board but did not post any articles themselves and a further 2 students posted articles to the discussions board but did not read postings make by anyone else. Of those who used WebCT to gain access to materials, the majority (67.2%) accessed between 50 and 200 pages of the system (average 104 hits). Similarly the majority (59%) read more than 10 of the articles posted to the bulletin board (average 21 articles read).

| | Mean | Minimum | Maximum |
|---|---|---|---|
| Total hits | 104 | 0 | 327 |
| Number of articles read | 21 | 0 | 75 |
| Number of articles posted | 2 | 0 | 10 |

**Table 10: WebCT access summary**

| | No. | % |
|---|---|---|
| Used all facilities (Accessed materials, read and posted articles to discussion facility) | 36 | 59% |
| Accessed materials only (did not use discussion facility) | 8 | 13.1% |
| Accessed materials and read discussions (but did not contribute) | 11 | 18% |
| Accessed materials and posted articles (but did not read discussions) | 2 | 3.3% |
| Did not access WebCT | 4 | 6.6% |

**Table 11: General use of WebCT facilities**

| Number | Total hits % | Articles read % | Articles posted % |
|---|---|---|---|
| 0 | 6.6 | 23.0 | 37.7 |
| 1-10 | 4.9 | 18.0 | 62.3 |
| 11-50 | 13.1 | 45.9 | 0.0 |
| 51-100 | 26.2 | 13.1 | 0.0 |
| 101-150 | 24.6 | 0.0 | 0.0 |
| 151-200 | 16.4 | 0.0 | 0.0 |
| 201-250 | 4.9 | 0.0 | 0.0 |
| 251-300 | 1.6 | 0.0 | 0.0 |
| 301-350 | 1.6 | 0.0 | 0.0 |

**Table 12: Detailed accesses to WebCT**

The overlaid scatter plots in Figure 2 shows the relationships of the total number of hits made by each case study 1 students with their corresponding number of articles read (in red) and the number of articles posted (in green). It is not surprising that bivariate (Pearson) correlation analysis result in significance values of p = 0.000 for both relationships.

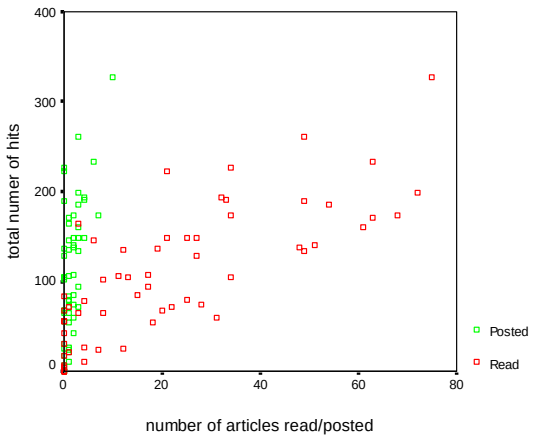



**Figure 2: Overlay scatter plot of total hits x articles read and total hits x articles posted**

WebCT statistics do not provide detail as to the percentage of all case study 1 students accesses to WebCT by time period (i.e. week of course, day of week or time of day).

Statistics (independent sample t-test) indicate that students with English as 1st language make more hits and read more articles than those for whom English is an alternative language.

| | | N | Mean | Std Deviation | T | df | Sig (2-tailed) |
|---|---|---|---|---|---|---|---|
| Total hits | English | 48 | 113.52 | 78.595 | 2.622 | 32.249 | 0.013 |
| | Other | 13 | 68.16 | 47.092 | | | |
| Articles read | English | 48 | 24.50 | 23.128 | 3.497 | 47.862 | 0.001 |
| | Other | 13 | 9.46 | 9.778 | | | |

**Table 13: All case study 1 students accesses to WebCT by first language**

There were no other significant correlations between other factors and use of WebCT.

Based on the success of this exercise, the team plan to

> *"deliver the unit in 2003-4 by 'blended learning', adapting existing teaching material considered appropriate for interactive online learning tutorials and drawing from online material already in existence in the University to avoid duplication of effort."* (tutor – 2nd interview)

The unit

> *"will be assessed by a portfolio of short assignments completed throughout the year, with links to the work being carried out in other units where possible. Some of the group tutorial activities will form the basis of Personal Development Plans to be stored via WebCT for students and their tutors."* (tutor – 2nd interview)

In terms of uptake it is still a number of

> *"localised people who seem to be doing things, rather than a central strategy."* (tutor – 2nd interview)

There have been Faculty talk-shops about things like WebCT where staff have been invited to attend however beyond this enthusiast group there is still considerable inertia within the department:

> *"we've got too much to do."* (tutor – 2nd interview)

**Case Study 2**

For case study 2, the VLE, StudyNet, had been run as a pilot scheme in the previous academic year. Although considered to be *"a very exciting, interesting development"*, the institution

> *"looked at WebCT and Blackboard but decided they'd rather build their own as they didn't want to be locked in financially to a particular vendor."* (tutor – 2nd interview)

Unlike many of the other large scale commercial products on the market

> *"StudyNet has an interesting history because it was done on an incredibly small budget …. it was one person really that pioneered it with a couple of programmers and got the university to give them what we all thought was a ludicrously small budget …I think we have all been incredibly surprised by how successful it has been"* (tutor – 2nd interview).

Clearly some of the commercial systems *"are more flexible"*, however there has been a

> *"lot of feedback from staff, through steering group and technical group who have been able to cater it according to what staff want."* (tutor – 2nd interview)

There is

> *"flexibility and growth potential within it, it is becoming more popular across the university."* (tutor – 2nd interview)

Nevertheless for StudyNet to make a difference to effectiveness, there needs to be an

> *"ongoing program of development (to ensure) online assessment."* (tutor – 2nd interview)

and an ability to monitor student engagement with the system.

This year StudyNet's use was compulsory for all Level 1 modules:

> *'The VLE was used throughout the academic year for all their courses to a greater or lesser extent….it was also used for general university information and news and for access to university email.'* (tutor – 2nd interview)

Within the module under observation, StudyNet was used

> *"as an organisational tool so its initial use for us was as a way of us organising our own delivery really not as a pedagogic tool at all so for example all the materials are put up there, all the materials, all the slides, all the handouts, all the practical sheets, which, although it is of benefit to the student, the original benefit was actually so that we would always have the most up-to-date version….then we also made the decision not to use notice boards so everything was put up by StudyNet."* (tutor – 2nd interview)

Tutors have primarily used StudyNet

> *"as a means of allowing it to give access to notes 24 hours a day so that they can access material when they want to….. I tend to put my lecture notes up either just before the lecture or just afterwards …..some of them will use it a lot and some of them hardly at all. The most frequent way that the students use the discussion facilities are for clarification on things that they might have got in class or just for simple questions……. I found it really useful for when I found it a good Web site in that I can say well have a look at this because I think it illustrates an excellent point. That can go on outside the limits of the lecture or tutorial time ….. Because we don't have Web access in all the lecture rooms it means that they can go off on their own time."* (tutor – 2nd interview)

Overall VLE activities recorded included access to notes and practical sheets, module information, message board, Lisp practicals, communicating with lecturer, online class discussion and group work.

One interesting development was that tutors decided to

> *"put up hand written versions (of solutions) which allowed them to see how the solutions were developed though somebody just sat down and did the exercises, mistakes and all and then just scanned them in. That is quite interesting because …. it meant that the students saw that there were somebody's attempts at solving the problem rather that technical examples."* (tutor – 2nd interview)

One aspect of using the VLE which was not used this year but which tutors would have liked to have used was to link some multiple choice question facility:

> *"We really wanted to give much more formative structure, continuous assessment, not summative assessment. We wanted the students to do exercises of the correct level at the level they were effective at right from week one. Although there are embedded exercises there is a danger that the students either look at the questions and say yes I can do that and don't or look at it and say no I can't do it and don't."* (tutor – 2nd interview)

The Learning Resource Centre is also currently

> *"talking about customising the whole information structure so that for example you will be able to customise lists of resources for students on particular courses, I can see some advantages to that, the only worry is that it might increase the dependency of students on everything being given to them."* (tutor – 2nd interview)

The University is currently evaluating the use of StudyNet with staff:

> *"a university wide survey on how academic staff use StudyNet and the usefulness and the training and support that they have available to them."* (tutor – 2nd interview)

No logs are available showing engagement with the VLE for case study 2.

# 8. Student Preparedness

**Case Study 1**

***At the start of the module***

WebCT is used in other modules in the first year so most students had encountered it prior to starting this module:

> *"all students new to the Department in 2002-3 used WebCT at an early stage in their course……they've been introduced to it last term …. and we think they've all used it but some people may have slipped through the net."* (tutor – 2nd interview)

Nevertheless, tutors provide a tutorial sheet to get students started (showing them how to log on to WebCT if they have forgotten) and work through in a laboratory environment:

> *"most don't have any problem logging on etc., we had that first session when they were in the lab so they could watch and see that they were OK. We are still seeing them every week, in lecture, seminars. … there is quite a variety of support in place."* (tutor – 2nd interview)

Tutors are very willing to provide support:

> *"I've told them if you can't get on just email me."* (tutor – 2nd interview)

Students use WebCT in lab sessions:

> *"they have been using online learning in the lab sessions right from the beginning ….they were used to the idea of the lab sessions being about online learning …. people involved. So the students had an introduction as to what was expected of them, after that I think its better to introduce WebCT a couple of weeks down the line, because of students enrolling late and that. I did it gradually."* (tutor – 2nd interview)

At interview the online self-help tutorial was noted as being particularly helpful, ensuring understanding of how to use the system. Physical help and support from tutors and fellow students was also noted.

Just over half of the respondents (52.5%) had used WebCT prior to the start of the module, with 96.8% of those who had used it before having used it for more than 1 hour.

Respondents were generally confident about using the internet (91.8% confident or very confident) with all respondents reporting some confidence. Confidence in working and learning online was slightly lower (80.3% confident or very confident) although the proportion of students who considered themselves to be very competent was significantly decreased. There was a further reduction in levels of confidence in finding their way around WebCT (68.9% confident or very confident). Levels of confidence in using the WebCT system were identical to levels of confidence in obtaining information via the system. Students were even less confident about taking part in online discussions (55.8% confident or very confident). Not surprisingly for information science students very few students reported little confidence in any of these areas (only 1.6% in working and learning online and taking part in online discussions) with no student recording no confidence.

Confidence in the subject being studied showed a wider range of responses, although 86.9% of respondents reported at least some confidence.

61 students responded to the question '*what, if any, introduction have you had to working with WebCT?*' 37 reported some introduction including:

- Introduction in lecture/seminar/tutorial
- Online tutorials, talks about using it in lectures
- Through another module
- Worksheets to work through earlier in the year

24 students reported that they had no introduction.

4 students voiced concern about using WebCT as follows:

- Tutorials
- Lack of motivation completing the work
- If some error happened when doing test in WebCT
- Not enough time in sessions - tend to rush through and not achieve full understanding

One student who has dyslexia finds it difficult.

93.1% of students reported no concerns. No student had communication concerns.

| **Have you used WebCT before the beginning of this module?** | **%** |
|---|---|
| Yes | 52.5 |
| No | 47.5 |
| **If so, for how many hours?** | % of those answering yes |
| <=1 hour | 3.2 |
| >1-5 hours | 77.4 |
| >5-10 hours | 16.1 |
| >10-20 hours | 3.2 |
| >20 hours | 0.0 |

**Table 14: Questionnaire 1: questions 6 and 7**

| | | % Very Confident | % Confident | % Some Confidence | % Little Confidence | % No Confidence |
|---|---|---|---|---|---|---|
| Using the internet | Q1 | 50.8 | 41 | 8.2 | 0 | 0 |
| | Q2 | 51.9 | 37 | 11.1 | 0 | 0 |
| Working and learning online | Q1 | 13.1 | 67.2 | 18 | 1.6 | 0 |
| | Q2 | 29.9 | 40.7 | 29.6 | 0 | 0 |
| Finding their way around in WebCT | Q1 | 8.2 | 60.7 | 31.1 | 0 | 0 |
| | Q2 | 11.1 | 70.4 | 14.8 | 3.7 | 0 |
| Obtaining information via WebCT | Q1 | 8.2 | 60.7 | 31.1 | 0 | 0 |
| | Q2 | 18.5 | 51.9 | 29.6 | 0 | 0 |
| Taking part in online discussions | Q1 | 6.6 | 49.2 | 42.6 | 1.6 | 0 |
| | Q2 | 18.5 | 40.7 | 40.7 | 0 | 0 |
| The subject being studied in this module | Q1 | 8.2 | 42.6 | 36.1 | 11.5 | 1.6 |
| | Q2 | 14.8 | 40.7 | 40.7 | 3.7 | 0 |

**Table 15: Questionnaire 1 and 2 student confidence**

Statistics (independent sample t-tests) show that male students were more confident about the subject they were studying than their female counterparts (p=0.04). Mature students (those aged over 21) were more confident than their younger colleagues (under 21 years of age) (p= 0.019). Statistics show no significant correlation between confidence and first language.

| **How confident are you?:** | | Mean | Std Deviation | t | df | Sig (2-tailed) |
|---|---|---|---|---|---|---|
| Using the Internet | <21 | 1.12 | 0.781 | -2.417 | 59 | 0.019 |
| | >21 | 1.55 | 0.548 | | | |
| The subject you are studying in this module | M | 1.00 | 0.642 | 2.101 | 59 | 0.040 |
| | F | 0.65 | 0.629 | | | |

**Table 16: Questionnaire 1, question 5, age and gender significance**

***At the end of the module***

Overall, there was a general trend of increased confidence across all factors during the semester. No student recorded '*no confidence*' in any area. All students recorded some confidence in using the internet, working and learning online, obtaining information via WebCT and taking part in online discussions. Only 1 student recorded little confidence in the subject being studied. Curiously, 1

student reported little confidence in finding their way around WebCT at the end, despite having recorded some confidence at the beginning.

Histograms illustrate difference in confidence before and after module.

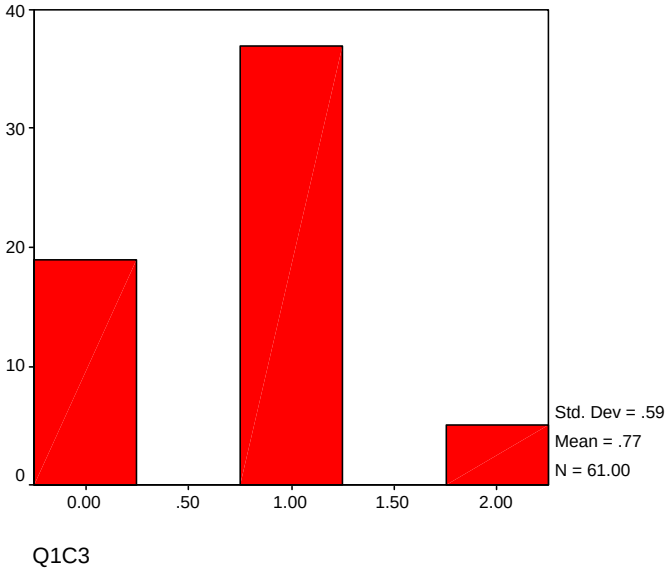



**Figure 3: Histogram of students' confidence in finding way around WebCT at the beginning of the module**

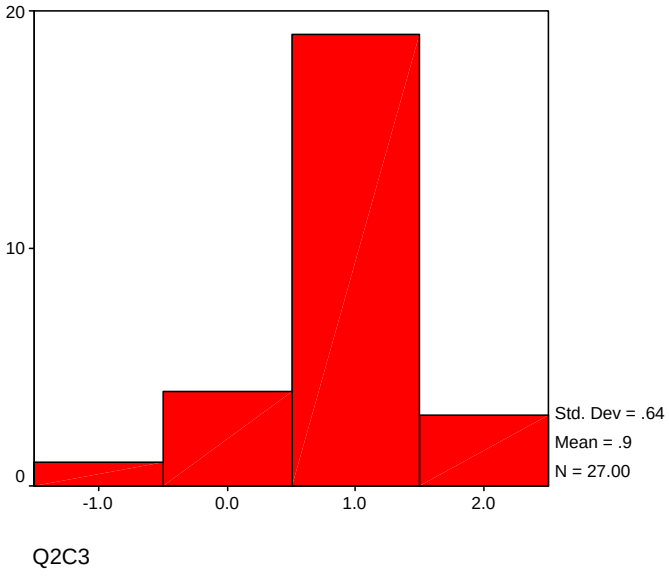



**Figure 4: Histogram of students' confidence in finding way around WebCT at the end of the module**

Statistics (independent sample t-tests) show that at the end of the module female students were more confident about:

(i) finding their way around in WebCT (p=0.018)

(ii) taking part in discussions (p=0.014)

(iii) the subject being studied (p=0.027)

At the end of the module students who had English as a second language were more confident about using the internet than those with English as a first language (p=0.000).

| How confident are you?: | | Mean | Std Deviation | t | df | Sig (2-tailed) |
|---|---|---|---|---|---|---|
| Finding your way around in WebCT | M | 0.55 | 0.668 | -2.541 | 25 | 0.018 |
| | F | 1.13 | 0.500 | | | |
| Taking part in discussions | M | 0.036 | 0.504 | -2.844 | 25 | 0.014 |
| | F | 1.06 | 0.772 | | | |
| The subject you are studying in this module | M | 0.27 | 0.647 | -2.343 | 25 | 0.027 |
| | F | 0.94 | 0.772 | | | |
| Using the internet | English | 1.36 | 0.700 | -4.511 | 24 | 0.000 |
| | Other | 2.00 | 0.000 | | | |

**Table 17: Questionnaire 2, question 3, gender and first language significance**

Paired sample t-tests were conducted to test for possible significant differences for each factor during the period of the semester. The results showed no significant difference in confidence over time.

The Pearson Correlation Coefficients recorded in Table 8.5 show correlation between:

- working and learning online (at the beginning) *and* finding their way around WebCT (at the end);
- finding their way around WebCT over time (i.e. correlation between confident at the beginning and the end);
- obtaining information via WebCT over time (i.e. correlation between confident at the beginning and the end).

to a 5% significance level.

| How confident are you?: | Using the Internet | Working and learning online | Finding your way around WebCT | Obtaining information via WebCT | Taking part in online discussions | The subject you are studying in this module |
|---|---|---|---|---|---|---|
| Using the Internet | .201 | .141 | -.154 | .097 | .033 | -.024 |
| Working and learning online | -.150 | .084 | .398* | .365 | .329 | .139 |
| Finding your way around WebCT | .065 | .092 | .400* | .367 | .107 | .153 |
| Obtaining information via WebCT | -.109 | .072 | .354 | .406* | .302 | .289 |
| Taking part in online discussions | -.074 | -.050 | -.096 | -.031 | -.006 | -.134 |
| The subject you are studying in this module | .038 | .153 | -.156 | -.057 | -.027 | .077 |

* Correlation is significant at the 0.05 level.

**Table 18: Correlation between question 5 (questionnaire 1) and question 3 (questionnaire 2)**

**Case Study 2**

StudyNet is used across the board on all first year courses, where it is mandatory. This is the first year where all the students have had training on it in the first year:

> *"there is a formal introduction to StudyNet - all first year students should have received training in StudyNet during induction."* (tutor – 2nd interview)

Furthermore, training sessions are set up for teaching staff and students:

*"an ongoing set of training sessions separately for staff and students and at different levels – both beginner and advanced."* (tutor – 2nd interview)

The module tutor also ran a 1 hour practical

*"with all the students in the first year. Because I teach on a course that is using it I actually wanted to teach them all during induction week. We put a little task up where they had to get information and print something off and then to contribute to some discussion ….we wrapped that up using the same lab that they were going to be using in their practicals, so we made it sort of an introduction to the lab. Because they are all Computer Science students they don't need much, it's pretty well supported I think".* (tutor – 2nd interview)

The tutor reported that this induction

*"wasn't a problem for any of them."* (tutor – 2nd interview)

Despite this background, fewer than one third (29.2%) of respondents had used StudyNet prior to the start of the module, although the majority of those who had used it before (57.1%) had significant experience, having used the system for more than 20 hours.

Given that students were enrolled on a computing course it is no surprise that all respondents were confident about using the internet (confident or very confident). Confidence in working and learning online was significantly lower (70.9% confident or very confident) with 4.2% reporting little confidence. Despite ready available of technology, computer scientists have been relatively slow to take up the challenge of innovative teaching methods including CBT and online techniques. This may in some part be due to the fact that a rapidly changing curriculum, requires continuous update of syllabi, leaving little time for the adoption of innovative techniques.

Despite limited prior exposure to StudyNet, all students recorded at least some confidence in finding their way around WebCT (87.5% confident or very confident) and in obtaining information via the system (75% confident or very confident). Students were considerably more reticent about taking part in online discussions (only 50% confident or very confident, with 16.7% recording little confidence and 4.2% no confidence) further underlining the fact that students of computing typically have limited exposure to innovative teaching and learning methods.

As in case study 1, confidence in the subject being studied, showed a wider range of responses, although no one recorded no confidence.

24 students responded to the question '*what, if any, introduction have you had to working with StudyNet?*' 15 reported some introduction ranging from:

- Basic tour around it, where everything is, the layout, etc
- Help lessons available in the library
- Introduction to StudyNet in Induction week where we could use and ask questions
- Introductory course
- Class discussions, looking around each area
- There was a navigation exercise to where the files were, etc
- A brief overview at beginning of the course
- Leaflet of information
- Brief introduction in lectures

9 students reported that they had no introduction.

3 students voiced concern about using StudyNet, ranging from:

- Sometimes hard to find things
- Can't transfer work on floppy disk to my PC
- Not updated, e-mail takes longer time

87.5% of students reported no concerns.

| **Have you used StudyNet before the beginning of this module?** | **%** |
|---|---|
| Yes | 29.2 |
| No | 70.8 |
| **If so, for how many hours?** | % of those answering yes |
| <=1 hour | 14.3 |
| >1-5 hours | 14.3 |
| >5-10 hours | 0.0 |
| >10-20 hours | 14.3 |
| >20 hours | 57.1 |

**Table 19: Questionnaire 1: questions 6 and 7**

| | | % Very Confident | % Confident | % Some Confidence | % Little Confidence | % No Confidence |
|---|---|---|---|---|---|---|
| Using the internet | Q1 | 83.3 | 16.7 | 0 | 0 | 0 |
| | Q2 | 78.3 | 8.7 | 13.0 | 0 | 0 |
| Working and learning online | Q1 | 41.7 | 29.2 | 25.0 | 4.2 | 0 |
| | Q2 | 52.2 | 26.1 | 13.0 | 8.7 | 0 |
| Finding their way around in StudyNet | Q1 | 41.7 | 45.8 | 12.5 | 0 | 0 |
| | Q2 | 47.8 | 39.1 | 13.0 | 0 | 0 |
| Obtaining information via StudyNet | Q1 | 37.5 | 37.5 | 25.0 | 0 | 0 |
| | Q2 | 30.4 | 43.5 | 26.1 | 0 | 0 |
| Taking part in online discussions | Q1 | 16.7 | 33.3 | 29.2 | 16.7 | 4.2 |
| | Q2 | 21.7 | 43.5 | 13.0 | 13.0 | 8.7 |
| The subject being studied in this module | Q1 | 8.3 | 66.7 | 16.7 | 8.3 | 0 |
| | Q2 | 17.4 | 60.9 | 21.7 | 0 | 0 |

**Table 20: Questionnaire 1 and 2 student confidence**

Statistics (independent sample t-tests) show that female students were more confident about the subject they were studying than male students (p=0.042). Mature students (those aged over 21) were more confident than their younger colleagues (under 21 years of age) (p= 0.003). Likewise students who spoke English as a first language were more confident than those for whom English was an additional language (p=0.005).

| **How confident are you?:** | | Mean | Std Deviation | t | df | Sig (2-tailed) |
|---|---|---|---|---|---|---|
| Using the Internet | M | 1.79 | 0.419 | -2.191 | 18 | 0.042 |
| | F | 2.00 | 0.000 | | | |
| Obtaining information via StudyNet | <21 | 0.43 | 0.535 | -3.275 | 22 | 0.003 |
| | >21 | 1.41 | 0.712 | | | |
| Working and learning online | English | 1.44 | 0.727 | 3.097 | 22 | 0.005 |
| | Other | 0.38 | 0.916 | | | |

**Table 21: Questionnaire 1, question 5, gender, age and first language significance**

***At the end of the module***

Unlike case study 1, there was little change in confidence levels across all factors during the semester. No student recorded '*no confidence*' in any area. All students recorded some confidence in using the internet, finding their way around StudyNet, obtaining information via StudyNet and in the subject being studied. 2 students recorded little confidence in working and learning online (both of whom had recorded some confidence at the start of the module). More than 20% of students (21.7%) still had little or no confidence in taking part in online discussions. The same two students who had recorded little confidence in working and learning online recorded no confidence in this aspect despite one having recorded confidence and the other some confidence at the beginning. Both students are mature females for whom English is a second language.

Histograms show little difference in confidence before and after module compared with case 1.

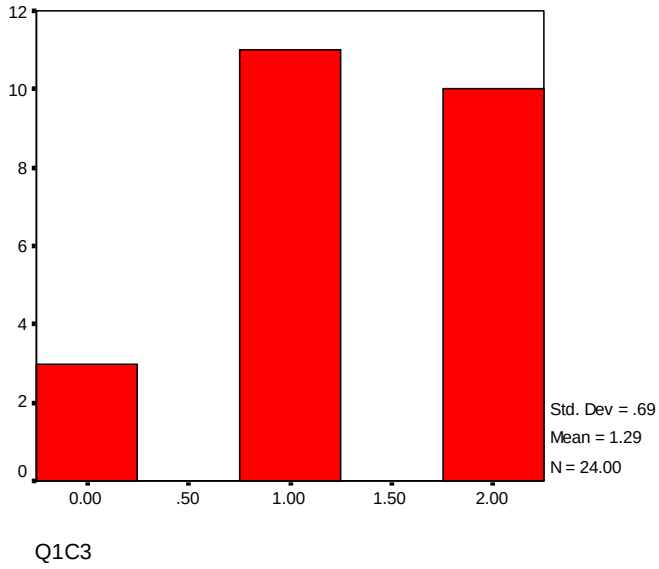



**Figure 5: Histogram of students' confidence in finding way around StudyNet at the beginning of the module**

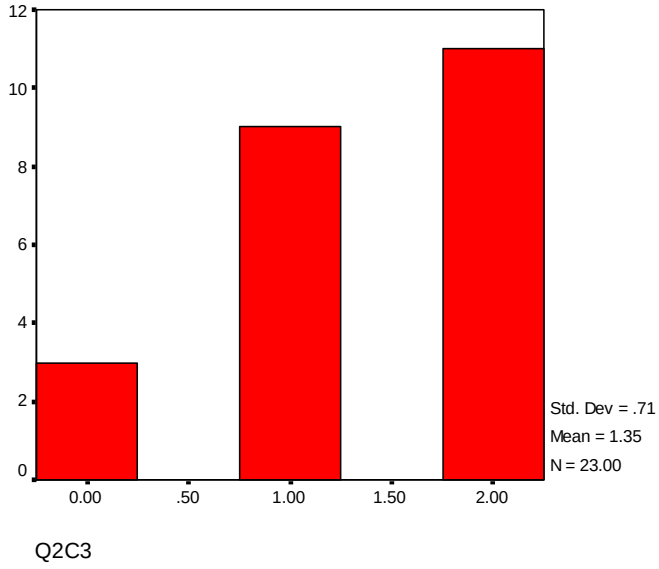



**Figure 6: Histogram of students' confidence in finding way around StudyNet at the end of the module**

Independent sample t-tests showed no significant differences in confidence across the various factors.

Paired sample t-tests were conducted to test for possible significant differences for each factor during the period of the semester. Again the results showed no significant difference in confidence over time.

The Pearson Correlation Coefficients recorded in Table 8.8 show no significant correlation between students' confidence at the beginning and end of the module, across all factors.

| **How confident are you?:** | Using the Internet | Working and learning online | Finding your way around StudyNet | Obtaining information via StudyNet | Taking part in online discussions | The subject you are studying in this module |
|---|---|---|---|---|---|---|
| Using the Internet | .177 | -.046 | .193 | .022 | .074 | .387 |
| Working and learning online | -.199 | .335 | .046 | -.012 | .385 | .186 |
| Finding your way around StudyNet | -.362 | -.285 | -.193 | -.280 | -.234 | .027 |
| Obtaining information via StudyNet | -.377 | -.285 | -.196 | -.166 | -.201 | .016 |
| Taking part in online discussions | -.181 | -.165 | -.139 | -.031 | .156 | .396 |
| The subject you are studying in this module | -.332 | -.219 | -.353 | -.075 | -.098 | .200 |

No significant correlations

**Table 22: Correlation between question 5 (questionnaire 1) and question 3 (questionnaire 2)**

# 9. Motivation

**Case Study 1**

Part of the rationale behind this module is aimed at improving student confidence and make them more independent learners:

> *"they're really quite competent (when they arrive at university) and we don't want to be traipsing over the same old ground, ….what they may need is the further development of those skills so they can use them in different ways…. that basic level is pretty much there when they come in and I think we really need to move that forward. Probably doing more database stuff, because that is quite fundamental to a lot of what is on the course* ***…..*** *give them a better foundation for future units and second and third year."* (tutor – 2nd interview)

It was this need to move things forward that motivated the introduction of the citation tutorial:

> *"I think the traditional way in which we taught citations doesn't meet the change in population of students that we have. …. we've got more of a mix of students now, from different backgrounds."* (tutor – 2nd interview)

Students don't particularly enjoy citations so tutors need to work harder in order to make it more interesting for them:

> *"I would always be looking to develop the way in which we teach them to make it more relevant…it's very difficult (to motivate them), we've got a lot of cultural mixes ….trying to cater for that it's quite difficult, interesting too."* (tutor – 2nd interview)

Tutors soon realised that students are becoming more strategic in their learning patterns:

> *"I changed how I was going to do it. They said they would only do it if it was assessed, and that meant the quizzes, which I had originally intended to be just a bit of fun. It's now become*

*part of the assessment but I think it has strengthened it. I'm learning a lot too, using it with larger numbers of students which I haven't done before."* (tutor – 2nd interview)

The change assessment also seems to have improved motivation:

*"I think the idea of the portfolio has been keeping their noses to the grindstone which makes them work in a more regular way. I think that has worked and … I'm pleased they feel so positive about it…I think the presentations worked quite well …. keeping diversity of use, working in pairs has been very useful. I think using it in first term would be a bit more difficult because they don't know each other."* (tutor – 2nd interview)

WebCT was used for a number of reasons, one of which was to improve participation:

*"also to improve student retention through the use of online learning combined with small group work and face-to-face tutorials."* (tutor – 2nd interview)

LCT is

*"a module that the students think they don't need to do, they already know all about it, and attendance can be a real problem, so the thinking behind developing a portfolio approach …… they would have a bit of assessment each week or even every other week, so it just kept them ticking along……it could be done in class if they came. So that's why we developed this particular style of assessment for it, and I think it did actually work very well ….it did keep students coming and working steadily through."* (tutor – 2nd interview)

The biggest advantage of using WebCT is seen to be its flexibility:

*"I think it created a minor community which was good, because they would get together. You would see 2 off them together on Web CT and doing things together. It allows you to do things more independently as well. As well as working together they could do other things they wanted to do and that was one of the reasons the students like using it."* (tutor – 2nd interview)

Broadly speaking it has been a big success although:

*"students get a little bit frustrated when things don't work or they don't understand it."* (tutor – 2nd interview)

At interview, most students found that their motivation levels were positively influenced by use of the VLE in comparison to other modes of learning and that working online helped them to feel part of the group. One student commented that the VLE was better than a lecture for some aspects of the module. All students were positive and enthusiastic about this new way of learning, commenting particularly on its interactive nature. Overall use of the VLE had been a positive experience, resulting in increased confidence and students were definitely more motivated and enthusiastic as a result. One criticism was that the system was sometimes quite slow but despite low expectations at the beginning for most it had been a very positive experience. Students recorded no negative experiences in using the VLE and found it more useful than traditional chalk and talk.

***At the beginning of the module***

The vast majority of students are motivated by getting good marks in the assignment (89.9% agree or strongly agree). Only 57.6% (agree or strongly agree) indicate that they are interested in the subject matter of the module, with 25.4% (agree or strongly agree) indicating that they were only undertaking the module to gain credits. 50% of students felt they were good at the subject and expected to do well however 30.5% were concerned that they may not do well in the module. More than half (54.3%) were doing the module to help them achieve their personal goals. Only 22.1% felt that it was important to do better than others in the group.

| | % Strongly agree | % agree | % neither agree or disagree | % Disagree | % Strongly disagree |
|---|---|---|---|---|---|
| The most important thing is getting good marks in assessment(s) | 45.8 | 44.1 | 6.8 | 3.4 | 0 |
| I am really worried that I may not do well in this module | 3.4 | 27.1 | 32.2 | 30.5 | 6.8 |
| I am interested in the subject matter of this module | 5.1 | 52.5 | 30.5 | 8.5 | 3.4 |
| I am doing this module to help me achieve my personal goals | 13.6 | 40.7 | 32.2 | 13.6 | 0 |
| I am good at this subject and expect to do well | 6.9 | 43.1 | 48.3 | 1.7 | 0 |
| It's important to do better than others in the group | 6.8 | 15.3 | 42.4 | 32.2 | 3.4 |
| I am only doing this module because I need the credits | 6.8 | 18.6 | 42.4 | 23.7 | 8.5 |

**Table 23: Questionnaire 1; question 8**

Independent sample T-tests showed that first language had no significant difference in confidence in doing well in the module (worried I may not do well p=1.000, good at subject and expect to do well p=0.475).

Motivation (1=Unmotivated, 10=Highly motivated)

| | 0-<1 | 1-<2 | 2-<3 | 3-<4 | 4-<5 | 5-<6 | 6-<7 | 7-<8 | 8-<9 | 9-<10 | 10 | Mean score |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % | 0 | 0 | 1.7 | 3.4 | 6.9 | 8.6 | 20.7 | 32.8 | 18.9 | 6.9 | 0 | 6.53 |

**Table 24: Questionnaire 1; question 9**

On the whole, students enrolled on this module were motivated at the outset with 79.3% of respondents indication a motivation level in the upper half of the scale (6 -10).

***At the end of the module***

A paired-sample T-test was conducted to evaluate the impact of the intervention on students' motivation before and after the module. Although the mean went down slightly over the time period (0.42), tests show no significant difference between students' motivation at the beginning and at the end of the module.

Motivation (1=Unmotivated, 10=Highly motivated)

| | 0-<1 | 1-<2 | 2-<3 | 3-<4 | 4-<5 | 5-<6 | 6-<7 | 7-<8 | 8-<9 | 9-<10 | 10 | Mean score |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % | 0 | 0 | 3.8 | 7.7 | 7.7 | 7.7 | 23 | 38.5 | 11.5 | 0 | 0 | 6.11 |

**Table 25: Questionnaire 2, question 1**

| | Using the Internet | Working and learning online | Finding your way around WebCT | Obtaining information via WebCT | Taking part in online discussions | The subject you are studying in this module |
|---|---|---|---|---|---|---|
| The most important thing is getting good marks in assessment(s) | 0.175 | 0.059 | 0.058 | 0.086 | -0.018 | 0.195 |
| I am really worried that I may not do well in this module | -0.279* | -0.209 | -0.361** | -0.332* | -0.262* | -0.312* |
| I am interested in the subject matter of this module | -0.213 | 0.012 | 0.022 | 0.029 | -0.179 | 0.024 |
| I am doing this module to help me achieve my personal goals | -0.135 | 0.022 | 0.084 | 0.193 | 0.074 | 0.069 |
| I am good at this subject and expect to do well | 0.238 | 0.246 | 0.279* | 0.172 | 0.111 | 0.407** |
| It's important to do better than others in the group | -0.013 | 0.014 | -0.013 | -0.038 | 0.036 | 0.061 |
| I am only doing this module because I need the credits | 0.107 | -0.255 | -0.203 | -0.077 | 0.159 | 0.111 |

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

**Table 26: Correlation between question 5 (Q1) and question 8 (Q1)**

Statistical tests (Pearson Correlation) show some significant correlations between confidence and motivation. Those who were worried about '*not doing well in the module*' showed lower confidence in using the internet, finding their way around WebCT, obtaining information via WebCT, taking part in online discussions and in the subject they were studying. Those who felt they were '*good at this subject*' and expected to do well, rate a higher level of confidence about finding their way around WebCT and in the subject they are studying.

| Factor | Negative % | Neither % | Positive % | Mean Positivity (Negative=-1, neither=0, Positive=+1) |
|---|---|---|---|---|
| Personal needs | 16.0 | 24.0 | 60.0 | 0.44 |
| Fellow students | 4.0 | 20.0 | 76.0 | 0.72 |
| Tutor | 8.0 | 12.0 | 80.0 | 0.72 |
| Course admin/regulations | 12.0 | 48.0 | 40.0 | 0.28 |
| Physical location | 33.3 | 25.0 | 41.7 | 0.08 |
| Help and support form Tutor/Other | 4.2 | 29.2 | 66.7 | 0.63 |
| Help and support from (VLE) or Computer | 20.8 | 8.3 | 70.8 | 0.50 |
| Working online | 16.7 | 12.5 | 70.8 | 0.54 |
| Communicating online | 0.0 | 29.2 | 70.8 | 0.71 |
| Access to computer | 20.8 | 33.3 | 45.8 | 0.25 |
| Technological issues | 16.7 | 54.2 | 29.2 | 0.13 |
| Other | 12.5 | 87.5 | 0.0 | -0.13 |

**Table 27: Questionnaire 2, question 2**

Fellow students, the tutor, help and support from the VLE, working online and communicating online were all very positive motivational factors for students.

**Case Study 2**

As with case study 1, tutors were concerned about student retention:

> *"what you notice is that rather than have a large group of students with the bottom end struggling you actually have a broader group of students with a group that are just opting out. That's a shame because you have no chance to remedy the situation If they don't turn up you can't do anything about it…… the majority of students who don't pass have actually fallen out."* (tutor – 2nd interview)

so again StudyNet has been used as a vehicle to distribute notes to those students who do not attend class.

One of the big benefits of using StudyNet on this module was observed in the discussion groups:

> *" it allows some of the better students to stamp their culture on the course which they used to be able do in groups of 50 but couldn't do in groups of 250. Where somebody asks a question which is quite clearly explained in the lecture (a trivial question) it allows the better students to come in immediately and answer… that's quite useful really."* (tutor – 2nd interview)

There is

> *"quite a lot (of discussion) I don't know how you'd quantify it or what you'd expect but it goes in fits and starts, there quite a lot now because of the exam…..it's in groups."* (tutor – 2nd interview)

Tutors were disappointed that there was no multiple choice question facility available within StudyNet:

> *"it may have been encouraging for the weaker ones to discover that they were actually among the weaker group of 80 rather than the only person who couldn't do it and it may have been encouraging to see that some students get 100%. There is a tendency for the weaker group*

*of students to say that the whole course is too hard, it is only when they realise that some other people are coping perfectly adequately that in some cases they are motivated into thinking – you are not that different from these people – they have crossed this bridge and you haven't."* (tutor – 2nd interview)

***At the beginning of the module***

The vast majority of students are motivated by getting good marks in the assignment (87.5% agree or strongly agree). 66.6% (agree or strongly agree) of respondents indicate that they are interested in the subject matter of the module, with 25% indicating that they were only undertaking the module to gain credits (although no student agreed strongly with this statement). Just over half of the respondents (54.2%) felt they were good at the subject and expected to do well (although again no student agreed strongly that they were good at the subject) however 33.4% were concerned that they may not do well in the module. More than half (58.3%) were doing the module to help them achieve their personal goals. Only 16.7% felt that it was important to do better than others in the group and again no-one strongly agreed with this statement.

| | % Strongly agree | % agree | % neither agree or disagree | % Disagree | % Strongly disagree |
|---|---|---|---|---|---|
| The most important thing is getting good marks in assessment(s) | 50 | 37.5 | 8.3 | 4.2 | 0 |
| I am really worried that I may not do well in this module | 4.2 | 29.2 | 29.2 | 37.5 | 0 |
| I am interested in the subject matter of this module | 8.3 | 58.3 | 29.2 | 0 | 4.2 |
| I am doing this module to help me achieve my personal goals | 12.5 | 45.8 | 29.2 | 8.3 | 4.2 |
| I am good at this subject and expect to do well | 0 | 54.2 | 41.7 | 4.2 | 0 |
| It's important to do better than others in the group | 0 | 16.7 | 58.3 | 25 | 0 |
| I am only doing this module because I need the credits | 0 | 25 | 29.2 | 33.3 | 12.5 |

**Table 28: Questionnaire 1; question 8**

Independent sample t-tests showed that students with English as a first language had more confidence in Course administration/registers. Age and gender did not affect confidence levels in any aspect of the module.

| **Specific motivation** | | Mean | Std Deviation | t | df | Sig (2-tailed) |
|---|---|---|---|---|---|---|
| Course admin/regs | English | 0.625 | 0.6191 | 2.270 | 21 | 0.034 |
| | Other | 0.000 | 0.5774 | | | |

**Table 29: t-test – motivation by first language**

Motivation (1=Unmotivated, 10=Highly motivated)

| | 0-<1 | 1-<2 | 2-<3 | 3-<4 | 4-<5 | 5-<6 | 6-<7 | 7-<8 | 8-<9 | 9-<10 | 10 | Mean score |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % | 0 | 0 | 0 | 4.3 | 8.7 | 13.0 | 21.7 | 34.8 | 17.4 | 0 | 0 | 6.28 |

**Table 30: Questionnaire 1; question 9**

On the whole, students enrolled on this module were motivated at the outset with 73.9% of respondents indication a motivation level in the upper half of the scale (6 -10).

***At the end of the module***

A paired-sample t-test was conducted to evaluate the impact of the intervention on students' motivation before and after the module. Although the mean went up considerably over the time period (0.74), tests show no significant difference between students' motivation at the beginning and at the end of the module.

Motivation (1=Unmotivated, 10=Highly motivated)

| | 0-<1 | 1-<2 | 2-<3 | 3-<4 | 4-<5 | 5-<6 | 6-<7 | 7-<8 | 8-<9 | 9-<10 | 10 | Mean score |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % | 0 | 0 | 0 | 0 | 8.7 | 4.3 | 17.4 | 34.7 | 30.4 | 0 | 4.3 | 7.02 |

**Table 31: Questionnaire 2, question 1**

Statistical tests (Pearson Correlation) showed no significant correlations between confidence and motivation on any factor.

| | Using the Internet | Working and learning online | Finding your way around WebCT | Obtaining information via WebCT | Taking part in online discussions | The subject you are studying in this module |
|---|---|---|---|---|---|---|
| The most important thing is getting good marks in assessment(s) | -.373 | .134 | .129 | .200 | -.307 | .144 |
| I am really worried that I may not do well in this module | -.367 | -.402 | -.203 | -.234 | -.339 | -.126 |
| I am interested in the subject matter of this module | -.187 | -.306 | .026 | .134 | -.032 | .144 |
| I am doing this module to help me achieve my personal goals | -.214 | -.387 | -.180 | -.202 | -.300 | -.106 |
| I am good at this subject and expect to do well | .194 | .000 | -.160 | .046 | .402 | .400 |
| It's important to do better than others in the group | -.058 | -.346 | .153 | .188 | .050 | .135 |
| I am only doing this module because I need the credits | .076 | .031 | -.229 | -.054 | .209 | .176 |

No significant correlation.

**Table 32: Correlation between question 5 (Q1) and question 8 (Q1)**

Fellow students and the tutor were the most positive motivational factors (>70%) for students.

| Factor | Negative % | Neither % | Positive % | Mean Positivity (Negative=-1, neither=0, Positive=+1) |
|---|---|---|---|---|
| Personal needs | 27.3 | 27.3 | 45.5 | .182 |
| Fellow students | 17.4 | 8.7 | 73.9 | .565 |
| Tutor | 8.7 | 4.3 | 87.0 | .783 |
| Course admin/regulations | 8.7 | 39.1 | 52.2 | .435 |
| Physical location | 36.4 | 22.7 | 40.9 | .046 |
| Help and support form Tutor/Other | 8.7 | 21.7 | 69.6 | .609 |
| Help and support from (VLE) or Computer | 13.0 | 87.0 | 0.0 | .870 |
| Working online | 8.7 | 21.7 | 69.6 | .609 |
| Communicating online | 18.2 | 18.2 | 63.6 | .455 |
| Access to computer | 42.9 | 19.0 | 38.1 | -.048 |
| Technological issues | 38.1 | 23.8 | 38.1 | .000 |
| Other | 42.9 | 52.4 | 4.8 | -.381 |

**Table 33: Questionnaire 2, question 2**

# 10. Student and Tutor Roles and Behaviour

**Case Study 1**

In case study one, the use of online learning was well received by the students and the approach considered successful by staff. There were 3 staff involved in this module, each with differing levels of experience. One was

> *"fairly confident, except this is the first time I've used quizzes. It's the first time really this year that I've used WebCT with large numbers of students. Up until now it's been smaller groups, so there's a lot to learn".* (tutor – 1st interview)

The second is *"less confident. I'm happy to use it at the level at which we use it".* (tutor – 1st interview) and the third has

> *"only just started using it properly within the last month … I've found it very easy to actually start using. I haven't really found it too difficult. I'm quite happy with it".* (tutor – 1st interview)

The tutors try to be available at both lectures and seminars:

> *"if you do the lectures and seminars, you do see more of the lecturer which is quite useful …. we get to know them better in smaller groups."* (tutor – 1st interview)

One of the tutors also teaches this group:

> *"a lot of them, say three quarters of them another subject ….. so I see them twice"* (tutor – 1st interview) which has helped in getting to know the students.

The three tutors involved works as a team as

> *"it is a big thing to manage on your own." "It's been really nice this year to not just be me doing it. Working with the other colleagues and thinking about other possibilities".* (tutor – 2nd interview).

One tutor checks more or less daily to see what has happened. The team also have access to some placement students and plan to make use of them next year. The tutor role is really one of minor facilitation:

> *"I try to be fairly hands off unless they have asked specific queries. I have managed it a little bit … I've tracked them. Looking regularly to see who is doing what."* (tutor – 2nd interview)

WebCT's tracking tools also

> *"revealed the need for early identification of non-participation and some incentives in the form of marks, e.g. for completing quizzes."* (tutor – 2nd interview)

This has informed the design of the LCT unit for the 2003-4 academic year, in which further WebCT tutorials and quizzes will be used:

> *"Next year they will be expected to access each week an element of the module on WebCT and it will be discussed in the tutorials. In the formal lecture sessions it will be used….so it frees us up in a way to deliver the unit better in a more appropriate way because it lends itself to the kinds of things we are trying to teach. And teaching in this way is probably more interesting for them"*. (tutor – 2nd interview)

Tutors find WebCT an excellent way of having additional supporting material but find that it can be "a bit long winded." They also find that

> *"it gives students opportunities to participate where they wouldn't normally….it's actually quite a small mark so some of them won't bother… I think it gets them used to different ways of learning, and I think the citations course is something that they find difficult and can't see the need for."* (tutor – 2nd interview)

Tutors also commented on student use of WebCT:

> *"I was quite impressed by the way the students took to it."* (tutor – 2nd interview)

They had hoped that WebCT would add

> *"more independence and flexibility"* (tutor – 2nd interview) which it has done however
>
> *"there's a real fear as well, of student demand when you introduce it…. you raise their expectations."* (tutor – 2nd interview)

Whilst tutors believe that

> *"for delivery on certain types of information and knowledge it could really be useful, and free up more time"* (tutor – 2nd interview),

there is concern from both students and tutors that the tutor may become too remote. Tutors comment that

> *"I enjoy the contact with classes and I think you need to be careful not to lose that"* and it *"can be a bit distancing".* (tutor – 2nd interview)

Talking to students similarly revealed a

> *"danger of not having as much one on one contact with the tutor so wouldn't like to see WebCT take over."* (student interview)

The use and integration of WebCT within the institution has been very gradual. The teaching team have experienced no specific technical problems,

> *"apart from being dependent on the server, if that goes down …."* (tutor – 2nd interview)

Early problems were largely due to inexperience with the system

> *"I think some of the issues were teething problems, because it was relatively new to me"* (tutor – 2nd interview).

Nevertheless tutors would like to see greater centralisation and sharing of experiences:

> *"There is a team of people, not a very big team…..if there's something that I've got stuck with there are people I can ask." "I'm quite happy with it for what I try and do with it, but it does have some very iffy ways of doing things, and the help pages aren't always totally clear."* (tutor – 2nd interview)

Issues were also raised concerning

> *"accessibility and looking more and more at WebCT with a view to looking how we can do things that are going to be accessible to students."* (tutor – 2nd interview)

On the whole the response to using WebCT has been very positive. One tutor recorded that it

> *"probably did exceed my expectations, I thought the students would do what they had to do and no more, but I was quite pleased that they did take it a bit further."* (tutor – 2nd interview)

Interviews with students revealed a definite need for tutor interaction which provided an informative source of support as the tutor encourages discussions. However, students were split in their opinions as to whether the VLE promoted self-directed learning. Some were of the opinion that they were to learn for themselves and all necessary information had been made available for them all of the time via the VLE, others felt that due to the nature of the work undertaken the VLE was not about supporting independent learning. The bulletin board was used to post/manage responses to each other and the tutor and most students felt that they had learnt from their fellow students. In particular there were positive comments regarding quick access to other students and an instant response to queries.

19 students (31.1%) did not answer Question 14 (Questionnaire 1) and 10 students (37%) did not answer Question 4 (Questionnaire 2). Responses to these questions are summarised below both by frequency and percentage of *responses* (we cannot accurately say percentage of population or of students as there are 52 responses from 42 students and 23 responses from 17 students for Question 14 (Questionnaire 1) and Question 4 (Questionnaire 2) respectively). Nevertheless 36.5% (questionnaire 1) and 43.5% (questionnaire 2) reported the academic as being the main support, with more than 30% in both questionnaires 1 and 2 citing support from the VLE as important.

| Type of support | Questionnaire 1 | | Questionnaire 2 | |
|---|---|---|---|---|
| | Is available (Q1) freq | Is available (Q1) % | Was available (Q2) freq | Was available (Q2) % |
| Academic support | 19 | 36.5 | 10 | 43.5 |
| Support staff | 2 | 3.8 | 0 | 0 |
| Peers | 4 | | 2 | 8.7 |
| Textual | 4 | 7.7 | 1 | 4.3 |
| Study support from the VLE content | 17 | 32.7 | 8 | 34.8 |
| Little | 1 | 1.9 | 0 | 0 |
| Self | 1 | 1.9 | 0 | 0 |
| Easy to use | 0 | 0 | 0 | 0 |
| Don't know | 1 | 1.9 | 0 | 0 |
| None | 0 | 0 | 1 | 4.3 |
| Lots | 2 | 3.8 | 0 | 0 |
| Other | 1 | 1.9 | 1 | 4.3 |
| Total | 52 | 100.0 | 23 | 100.0 |

**Table 34: Question 14 (Questionnaire 1) and Question 4 (Questionnaire 2)**

**Case Study 2**

Two of the 5 tutors on this module participated in interviews, both of whom did quite a lot of the organisation of the course from home. The best aspect of StudyNet was reported to be the organisation of teaching staff,

> *"there's 5 of us teaching on the course and there real benefit is that the 5 staff teaching it can all see exactly what is going on. If I write a practical sheet …. whoever is taking the practical knows that the practical will be on StudyNet ……which means I can write it over the weekend, I don't have to rush in and get it photocopied and circulated. They (students) can actually view it online."* (tutor – 2nd interview)

One tutor felt that the

> *"admin load on course leaders is genuinely reduced you do almost regain to a certain extent custodian of credit type role rather than bureaucrat type roles but not entirely, it allows students to be given more responsibility."* (tutor – 2nd interview).

The same tutor welcomes the opportunity to (time permitting) log in

> *"2 mins before my lecture I can go to StudyNet and see what is going on"* (tutor – 2nd interview).

Tutors are using StudyNet to distribute notes – this can be a time consuming task:

> *"it makes you focus on making your materials accessible ….. they are not always available in that medium, I had to scan pictures or examples in, it's quite irritating – definitely a change in my teaching, I tended to update things as I never used to make them all available electronically."* (tutor – 2nd interview).

The added effort does however benefit students considerably:

> *"at the moment we are not giving out handouts, so it does mean they have to download my notes. We have a high proportion of non-English speaking students, whose English is not good, from China for example, they can download the examples the night before and make*

*sure they can understand them so they can ask questions in the lecture. That is a real benefit to them… then they get more out of the lecture"* (tutor – 2nd interview).

There has also been development into the use of the bulletin board:

*"we use this primarily for students to get help either from us or from their peers"* (tutor - ?2nd interview).

This allows reflection on the material:

*"a lot of students are saying that they are going back to the material, they are thinking about it and the questions that they might ask about it are not limited to the time when they have staff present. They will go back and think about it and then they will put something up or email something and I think that is a benefit, they are not limited to the time and space of the class contact time."* (tutor – 2nd interview).

Students have also become experienced at providing peer support:

*"What tends to happen is we all log in every day or every other day or something and discover a strand has started up ….I cannot do something….someone else will either have chipped in with neither can I or someone will have put up a solution. Students have become quite good now at putting up solutions, saying what I tried was this…….sometimes I'll leap in and say well actually what I meant you to do was this. At other occasions I'll just sit back and watch them develop, sometimes the discussions are more valuable without me. Sometimes you will see the first person who happened to have got in has actually missed the point of the other person's question and has given them a tip which is actually going to make life very hard."* (student interview).

As a result, discussions are lightly moderated:

*"at the moment it's not too difficult a task, if it really takes off it, it could be quite tricky."* (tutor – 2nd interview) and tutors are

*"starting to get a feel for which of their (students) responses are likely to be quite sensible, 4 or 5 people have become quite good at giving tutorial support to other students."* (tutor – 2nd interview).

Tutors haven't used all the facilities:

*"I haven't used the group discussions where you split them up into groups and you can allow them their own area for discussion."* (tutor – 2nd interview).

One criticism is the fact that

*"at the moment there is no way of me setting up a document and having a check to see what students are accessing it …. that would be very useful."* (tutor – 2nd interview).

For example with important documents,

*" we have one document which tells them what the assessment criteria are. Last year I actually got them all to get a copy from our reception desk and sign for it even though it was on StudyNet. This year I haven't, I just assume they will all get it from StudyNet. Some of the questions I have had in the study group quite clearly shows that they haven't."* (tutor – 2nd interview)

Using StudyNet there is a temptation to say

*"it's your responsibility, everything is on StudyNet"*, however *"I do have a worry that because we don't monitor the students as closely as we should and also because we're not allowed at present to monitor usage of StudyNet we never actually know whether students are doing what they are supposed to be doing."* (tutor – 2nd interview).

As with all large classes, student support is an area of concern:

*"The thing that I think we do badly on that course which I guess is therefore the most challenging and I don't know how we fix it, is actually dealing with the needs of individual students because it is such a large class…..when a student has a misunderstanding and requires quality time, you feel that you are letting then down. In the old days they were in groups of 15 and you could identify with that student, you could say to the student come and see me afterwards. You simply can't do that, you do not have the resource, you don't have the contact with the students."* (tutor – 2nd interview)

StudyNet, has to some extent helped with this problem and tutors agree that it has definitely helped student learning but raise the concern that

> *"once the students have got used to using StudyNet they expect things to be there. They expect notes to be there and they expect a response to queries."* (tutor – 2nd interview).

Students reported no bad experiences:

> *"I don't think anything has been detrimental to the teaching."* (student interview).

StudyNet is considered to be a very robust system, which on the whole is well supported and is

> *"fundamental to the running of the institution". "Last year when it started I was prepared to try it but wasn't expecting too much but this year I've used it and it's fine."* (tutor – 2nd interview).

There is a central support (technical) team, to whom any questions are reported and different levels of support within each faculty:

> *"we have appointed someone within the faculty who came around and gave 1:1 assistance after the initial training."* (tutor – 2nd interview).

Any technical problems are only minor ones. However, tutors do get irritated when students use text messaging to address staff. Furthermore

> *"there are a few funny glitches with it but I am confident in using it for what we use it for, there are quite a few issues surrounding it which I think we need to think through like the impact on attendance. I would be wary of claiming to really understand all the pedagogy issues although I don't think anyone does…..in my heart of hearts I don't think it is impacting negatively, I don't think it is helping either. Maybe it is helping students to pass that would otherwise fail by not attending."* (tutor – 2nd interview)

As for Case Study 1, 2 students (8.3%) did not answer Question 14 (Questionnaire 1) and 10 students (43.5%) did not answer Question 4 (Questionnaire 2). Responses to these questions are summarised below both by frequency and percentage of responses. 30.8% (questionnaire 1) and 26.3% (questionnaire 2) reported the academic as being the main support, with 23.1% (questionnaire 1) and 31.6% (questionnaire 2) citing support from the VLE as important.

| Type of support | Questionnaire 1 | | Questionnaire 2 | |
|---|---|---|---|---|
| | Is available (Q1) freq | Is available (Q1) % | Was available (Q2) freq | Was available (Q2) % |
| Academic support | 8 | 30.8 | 5 | 26.3 |
| Support staff | 3 | 11.5 | 2 | 10.5 |
| Peers | 4 | 15.4 | 1 | 5.3 |
| Textual | 3 | 11.5 | 2 | 10.5 |
| Study support from the VLE content | 6 | 23.1 | 6 | 31.6 |
| Little | 1 | 3.8 | 0 | 0 |
| Self | 0 | 0 | 0 | 0 |
| Easy to use | 0 | 0 | 0 | 0 |
| Don't know | 1 | 3.8 | 0 | 0 |
| None | 0 | 0 | 2 | 10.5 |
| Lots | 0 | 0 | 1 | 5.3 |
| Other | 0 | 0 | 0 | 0 |
| Total | 26 | 100.0 | 19 | 100.0 |

**Table 35: Question 14 (Questionnaire 1) and Question 4 (Questionnaire 2)**

# 11. Discussion

**Case study 1**

Case study 1 looks at a foundation module which aims to support all students in acquiring the core skills needed to study at degree level. It brings together study skills, IT and self motivation. There is a strong emphasis on group working and presentation skills as well as finding information and citation. Through short assignments, students are encouraged to reflect on their learning needs, build up a portfolio of evidence of the skills acquired and plan for their personal development in subsequent years.

The VLE was used primarily to provide students with access to information and to assist discussion and communication, a move which was in general appreciated by the students. The tutor was trying to encourage learning by doing as this is essentially a skills based module. Students cover group dynamics and have to do a group exercise and a presentation in groups. Using the VLE tutors have found it easier to administer the group work elements of this module. Integrating WebCT has also enabled the tutors to change the assessment, and a portfolio is now used. The tutors intended approach in using the VLE was to get the students to interact more and this has been successful.

The use of WebCT has been instrumental in getting staff to think about current delivery of the module:

> *"I want to get rid of the lectures…….some of them felt the lectures were boring. Some were making comments about 'using WebCT'."* (tutor – 2nd interview)

Considerable thought and planning has already gone into revising delivery of the module:

> *"regular briefings and guidance on activities will be given to all staff involved in group tutorials to ensure consistency. Staff meetings to review progress, identify any difficulties and share ideas for further development will be held mid-way and at the end of each term. Additional staff development sessions in the use of WebCT will be organised should they be felt necessary."* (tutor – 2nd interview)

A detailed schedule of weekly seminars, online learning and group tutorial activities is already in place representing

> *"a significant change in practice involving 6 staff in group tutorial activities … lectures would be replaced by the online learning tutorials."* (tutor – 2nd interview)

and the time gained will be used for meetings with groups of approximately 15 students. The aim is to help students to get to know staff and each other better and enable staff to respond to individual needs.

WebCT is used in other modules in the first year so most students had encountered it prior to starting this module. Respondents were generally confident about using the internet. Confidence in working and learning online was slightly lower. There was a further reduction in levels of confidence in finding their way around WebCT. Not surprisingly for information science students very few students reported little confidence in any of these areas with no student recording no confidence.

Students' motivation levels were positively influenced by use of the VLE in comparison to other modes of learning. In particular working online helped them to feel part of a group. Part of the rationale behind this module is aimed at improving student confidence and making them more independent learners. However as students become more strategic in their learning patterns, they will only engage with an activity if it contributes towards their assessment mark. Developing a portfolio as part of the assessment seems to have improved motivation, as has diversity of activity and working in pairs.

All students were enthusiastic about this new way of learning, commenting particularly on its interactive nature. Despite low expectations at the beginning for most it had been a very positive experience, resulting in increased confidence and students were definitely more motivated and enthusiastic as a result. Students recorded no negative experiences in using the VLE and found it more useful than traditional chalk and talk. The vast majority of students are motivated by getting good marks in the assignment.

The use of online learning was well received by the students and the approach considered successful by staff. There were three tutors involved who worked as a team. One tutor checked more or less daily to see what had happened. Interviews with students revealed a definite need for tutor interaction which provided an informative source of support as the tutor encourages discussions. However, students were split in their opinions as to whether the VLE promoted self-directed learning. The bulletin board was used to post/manage responses to each other and the tutor and most students felt that they had learnt from their fellow students. In particular there were positive comments regarding quick access to other students and an instant response to queries.

The tutor role is really one of minor facilitation, although there has been some management of the discussions and some student tracking. The tracking tools revealed the need for early identification of non-participation and some incentives in the form of marks, e.g. for completing quizzes. Whilst tutors believe that the VLE is suitable for delivery on certain types of information and knowledge there is concern from both students and tutors that the tutor may become too remote.

Retention is never far from the mind of the ICS academic and in redesigning curriculum this is always at the forefront of discussions:

> *"we can use that lecture slot on their timetable as one to one tutorial, get a lot more staff involved in that and that's all to do with retention stuff etc., …tutorials are so important, getting to know the students, sort out problems, and who needs support….the lecture's were a bit boring, more interaction (is required)…..you can do that in small groups….some of them have said why is there not more technology in it, and I think for next year that's what we need to work on."* (tutor – 2nd interview)

The team are fully aware that integration of VLEs must be strategic in nature *"where it seems to add something extra*". Whilst WebCT was deemed to be an

> *"appropriate vehicle for delivering and monitoring an assessment"*, next year *"data collected from attendance registers and monitoring the use of the tutorials via WebCT tracking tools will be used to identify students needing additional support or encouragement, in liaison with personal tutors. This will help to identify any patterns of need from students from non-traditional backgrounds in order to ensure that additional support is provided as necessary."* (tutor – 2nd interview)

They also hope to improve communication using WebCT:

> *"in connection with the personal development planning that we're developing in that module…. being able to track and monitor will actually be very useful."* (tutor – 2nd interview)

Despite the success some concerns remain, there is the perception that because of incomplete integration with student records,

> *"you could end up causing problems for yourself that you've then got to spend time sorting out…. administratively and technically ….students who can't get access. I think that's another thing that staff are actually wary of."* (tutor – 2nd interview)

In addition tutors feel it is essential to

> *"have more than one tutor with designer access to put things right."* (tutor – 2nd interview)

Quizzes also caused problems but

> *"possibly give a time limit on completing the quiz. To make them do it week by week rather than have them completing it at the end."* (tutor – 2nd interview)

may solve the problem.

**Case Study 2**

Case study 2 focuses on a module where students learn some important theoretical ideas by using formal systems in the design of simple programs. An important strand of activity is the guided study, where students work through module texts, carry out paper-based exercises and use computer systems to explore the application of the theoretical ideas. This activity is supported by the supervised practical/workshop sessions and also through a structured approach to the provision of worked solutions and self-assessment exercises firmly rooted within the VLE which also hosts discussion groups and feedback mechanisms, to ensure that students have opportunities to communicate both with their peers and the module teaching staff.

The VLE was used primarily to provide students with access to information and to assist discussion and communication, a move which was in general appreciated by the students.

In this instance the VLE was used throughout the academic year for all their courses to a greater or lesser extent. Within the module under observation, the VLE was used as an organisational tool for delivery and allowing access to notes 24 hours a day. One interesting development was that tutors put up hand written versions (of solutions) which allowed them to see how the solutions were developed. The VLE had no multiple choice question facility, so it was impossible to provide formative, continuous assessment.

As with Case Study 1, StudyNet is used across the board on all first year courses, where it is mandatory. Despite this background, fewer than one third of respondents had used StudyNet prior to the start of the module, although the majority of those who had used it before had significant experience. Given that students were enrolled on a computing course it is no surprise that all respondents were confident about using the internet and needed little support. All students recorded at least some confidence in finding their way around WebCT and in obtaining information via the system. Students were considerably more reticent about taking part in online discussions underlining the fact that students of computing typically have limited exposure to innovative teaching and learning methods.

The students' motivation levels were positively influenced by use of the VLE in comparison to other modes of learning. In particular working online helped them to feel part of a group. The vast majority of students are motivated by getting good marks in the assignment; respondents indicate that they are interested in the subject matter of the module.

From a tutor point of view, the best aspect of StudyNet was reported to be the organisation of teaching staff and one tutor felt that the administrative load was genuinely reduced. Tutors using StudyNet mainly to distribute notes with use of the bulletin board for students to get help either from tutors or from their peers. This provides students with an opportunity to reflect on the material. Students have also become experienced at providing peer support and discussions are only lightly moderated.

Although StudyNet has no monitoring capabilities, it has to some extent helped with student support. However tutors raise concerns over raised expectations and the fact that students expect notes to be there and expect responses to queries.

StudyNet was developed on a limited budget and

> *"Because of that it has taken on a lot of support …. managing with so few resources. So everybody is going round and saying how wonderful it is. Even if there are minor problems we are not saying well that doesn't work, they are tending to say – well that doesn't work but it would be surprising if it did on the budget that they had."* (tutor – 2nd interview)

*"I was very cynical, very low budget development ….when I saw what they were proposing to deliver for that money I just laughed but they have done it… they really have developed a system which is very high quality."* (tutor – 2nd interview).

Despite its limitations StudyNet is already quite a big system and as with other systems tutors are choosing to use only those aspects which best suit their needs:

*"that is one of the problems … as it grows there will be bits that you don't necessarily use e.g. you can now attach online journals to your courses so that when a new edition of an online journal comes up, it comes up on your front page for you, at the moment I don't use that I haven't really thought it through. You can attach journals to your reading lists which could be useful for say a project student."* (tutor – 2nd interview).

StudyNet is becoming a major vehicle for dissemination of information …

*"(there is a) teaching area which has discussion on teaching and learning issues"* (tutor – 2nd interview).

It is

*"becoming increasingly used in all sorts of ways….just launched an aspect of StudyNet for research …. so now all our research students in theory should be using StudyNet. In practice that's been a bit slow in take-up."* (tutor – 2nd interview)

Another area where tutors envisage using StudyNet in the future is to support project supervision. This is currently not possible as StudyNet is set up on a per module basis and does not support groups within that module:

*"all project students would have access to just 1 StudyNet page whereas I really wanted to have StudyNet set up just for my students so that I could talk to them as a group. That's a minor irritation, project supervision is an area where I think StudyNet would actually be very useful."* (tutor – 2nd interview)

The biggest problem with StudyNet is not the system itself but

*"the fact that it sucks all the student data of the MIS systems…..students can only get access to StudyNet when …(they are) flagged as having payed their fees which means that during induction week quite a few of the students don't have access …students change, new students come along and that can take a few days. They're major problems."* (tutor – 2nd interview)

As with any centrally run system, there is often opposition in the trenches to centrally made decisions:

*"there are things that …are not necessarily well thought out for example there is a suggestion that all of our student handbooks are up in StudyNet and in doing so there will be a template released. Currently our student handbooks are all written for an appropriate group of students …some people see StudyNet as a way of regularising and controlling things and I think that is a retrograde step."* (tutor – 2nd interview)

## 12. References

Performance Indicators in higher education (http://www.hefce.ac.uk/Learning/perfind/2002/)

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# Appendix A

**Case 1: student interview, section 3: attitudes**

| Statement | Agree Strongly | Agree | Neutral | Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| Communicating online with the tutor and fellow students in this module was a real challenge | | 1 | 2 | 1 | |
| Online discussions were a good way to learn in this module | 2 | | 1 | 1 | |
| I like having everything for this module available in one place | 2 | 2 | | | |
| You have to think for yourself a lot with this kind of learning | | 1 | 1 | 2 | |
| We don't need a tutor for this course | | | 1 | 3 | |
| On this module, I have learnt a lot from discussions with fellow students | 1 | 1 | 2 | | |
| Working in (VLE) is all about working on your own | | 1 | 1 | 2 | |
| Working online in (VLE) encourages me to feel part of the group | 1 | 2 | | 1 | |

(frequency of participants' responses to each question)

## Appendix B

Case 1: student diary activities

| Diary 1 | | | | |
|---|---|---|---|---|
| **SOLE ID** | **Activity** | **Format** | **VLE tools?** | **Minutes** |
| | (text) | (VLE - V, Other electronic - E, Paper - P, face-to-face - F, Other - O) | (text) | (number) |
| CO01113 | WebCT: exercise 2 | V | WebCT exercise 2 | 15 |
| (24th Feb) | MRL | P | | 240 |
| | MRL | O, P | | 240 |
| | Coursework | P | | 120 |
| | Presentation LCT | Format | | 100 |
| CO01120 | Presentation LCT | F | | 60 |
| (24th Feb) | WebCT: tutorial | V | tutorial | 10 |
| | WebCT: tutorial | V | tutorial | 15 |
| | WebCT: tutorial | V | tutorial | 20 |
| | Communication tool | V | Chat room | 5 |
| CO01121 | LCT assessment | O | | 30 |
| (3rd Mar) | LCT assessment | V | Quiz: Citation tutorial | 40 |
| CO01125 | Preparing powerpoint presentation | E | | 60 |
| (24th Feb) | Checking discussion messages | V | | 10 |
| | Citation Quiz | V | Quiz | 15 |

| Diary 2 | | | | |
|---|---|---|---|---|
| **SOLE ID** | **Activity** | **Format** | **VLE tools?** | **Minutes** |
| | (text) | (VLE - V, Other electronic - E, Paper - P, face-to-face - F, Other - O) | (text) | (number) |
| CO01113 | Coursework | P | | 240 |
| (17th Mar) | Coursework | P | | 120 |
| | WebCT: test | V | test | 30 |
| | Coursework | O, P | | 240 |
| | | | | |
| CO01120 | WebCT Tutorial | V | Tutorial | 10 |
| (10th Mar) | WebCT Tutorial | V | Tutorial | 2 |
| | Communication tools / Discussion | V | post message | 5 |
| | Seminar | F | | 60 |
| | WebCT Tutorial | V | Quiz | |
| CO01121 | LCT Citation assessment | V | Quiz: Citation tutorial | 30 |
| (17th Mar) | LCT Seminar Group | F | | 30 |
| | Networked Information and Web Page design | F | | 60 |
| | Lab Session | O | | 60 |
| | Lecture | F | | 60 |
| | Seminar | F | | 60 |
| | LCT assessment | O | | 120 |
| CO01125 | WebCT Tutorial | V | | 15 |
| (17th Mar) | Checking Courseware | E | | 15 |
| | Preparing Portfolio | E | | 60 |
| | Preparing Portfolio | E | | 30 |