# Motivations of the Online Student

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*The great end of education is, to discipline rather than to furnish the mind; to train it to the use of its own powers, rather than fill it with the accumulations of others (Tyron Edwards 1809-1894)*

# Abstract

When courses are offered in online teaching mode we lose the constant feedback available during face-to-face classes. We report on the results of a study of one course taken online over three semesters. Problems were identified that appear to be associated with the motivation for students to choose the online course. Use of push technology to overcome these problems showed significant improvement in performance of the course. There is evidence that students are not able to perform effectively in the unstructured online environment. Comparison with two other courses, delivered face-to-face, indicates that students do not generally make use of the flexibility of online delivery. Evidence is presented that is consistent with students being motivated to study online by an increased ability to work "just in time".

**Keywords:** online learning, higher education; computer-mediated communication; faculty training, eLearning outcomes, student motivation, online student usage

# Introduction

Why is higher education using online learning systems? Proponents of the uses of the Internet in delivering education make many claims. Generally these claims are that online learning can increase the quality of learning experiences, that online learning can react more effectively to global competition in education, online learning can remove barriers of circumstance (time, place etc.) and is more flexible and accessible, more relevant to the times, and is more cost-effective than face-to-face learning, further, there are productivity gains to be made for the learning institution in instruction delivery costs (Garrison & Kanuka, 2004; Green & Gilbert, 1995; Kanuka & Kelland, 2008; McCarthy & Samors, 2009; Wong & Tatnall, 2009). Similarly Bates (1997) cites the most commonly given reasons for using technology in education are "*to improve access to education and training; to improve the quality of learning; to reduce the costs of education; to improve the cost-effectiveness of education*"

(Bates, 1997). We are also told (Franklin & Van Harmelen, 2007) that the implementation of Web 2.0 technologies across English universities will influence every aspect of higher education including teaching, learning and assessment and so on, ending with a call for more case studies of Web 2.0 usage in higher education. This is echoed by Kirkwood (2009) who appeals for fur-

ther studies of how online learning is actually being used by students (Garrison & Kanuka, 2004; Green & Gilbert, 1995; Kanuka & Kelland, 2008; McCarthy & Samors, 2009; Wong & Tatnall, 2009).

The literature is full of indeterminate, mixed research results and accounts of the successful (and less successful) adoption and implementation of technology in teaching, learning and administration in one form or another over nearly a 20 year period. Donnelly and O'Rourke (2007) on evaluating current online learning research and literature state the obvious, that online learning and forms of blended, hybrid models of online learning have been widely adopted across higher education institutions and have therefore reached a certain level of maturity, yet these researchers claim:

- Improved learning and cost savings have yet to be universally proved

- Expected wide benefits have not materialized (Donnelly & O'Rourke, 2007).

Many claims about online learning stem from a fundamental belief that traditional face-to-face teaching is inherently inefficient and that cost savings can be made (Bates, 1997; Twigg, 2003). There is also an unsupported assumption that students would dearly love the opportunity to study at their own pace in their own homes at the time of their choosing and that online learning technology will enable this 24 hours a day, seven days a week.

As with many universities today, at the Royal Melbourne Institute of Technology University (RMIT University), every course is required to provide a basic level of support using the online system that is called the learning hub. While there is no question that distributing teaching materials online is considerably more efficient for both academics and students in classes with large cohorts of students (Cohen & Nachmias, 2006; Twigg, 2003), there are doubts about other aspects of replacing face-to-face teaching with the Internet.

Agreement about cost savings and how to measure them in higher education is also indeterminate and variable, some propose that delivery is cheaper for small face to face classes compared to online small classes, however for cost savings to be made in e-learning, implementation must happen across a large number of courses catering to large numbers of students (Cohen & Nachmias, 2006).

In this study we looked at three courses. Two of them, we will call *face-to-face one* and *face-to-face two*, both are delivered with a few enhancements provided online. The third course, we will call *online course*, was taken online completely during 2008. Since then we have closely monitored the changes made to the *online course* over three semesters.

# Research Questions

Studies of online delivery of courses mostly concentrate on improvements to delivery systems. These can be directed at better methods of constructing learning materials (Boyle et al., 2006) or at creating a richer social environment either between students or between the student and the delivery system (Gulz, 2004).

These studies leave many questions unanswered, particularly those concerning student motivation.

- How are students using online learning resources?

- Which online resources attract the most activity? Is it course content such as lectures, tutorial material, assignments, books, course documents, course information, external links, announcements, interactive areas?

- How often and when do students log on?

- Can we discover from student activity whether the student is assessment focused, learning focused?

## What Do We Know About Online Courses?

Today increased student working hours outside university is an important consideration when looking at how students study, whether face-to-face or online. In a 2006 survey of the proportion of Australian students who received federal funding assistance (James, Bexley, Devlin, & Marginson, 2007) it was found only 35% of students received assistance (where in 2000 this figure was 42%). In the same study it was found that 71% of full time undergraduates worked about 15 hours a week during semester, 40 per cent of full-time students working reported that work had an adverse effect on their studies. One in four students regularly missed classes. Clearly students are now working longer hours and are less engaged on campus. One researcher cautions that understanding working students and their new patterns of engagement is an important issue facing universities and how education is delivered (James et al., 2007).

Some work has been done of identifying the characteristics that students find valuable when studying online. A large study of nine Australian universities by Spennemann (2007) looked at the assumption that students are choosing online courses because of the flexibility it gives them in study times. However, this investigation found that the overwhelming majority of students studied during the week and during normal working hours. An earlier, smaller Australian study looking at student use of on-line forums found similar usage patterns (Burr & Spennemann, 2004).

Another major Australian project (Kennedy et al., 2009), supported by the Australian Learning and Teaching Council, investigated the education and learning technology preferences of the so-called "Net Generation" (those born between 1980 and 1994, (McCrindle, 2003)) along with their educators. It is generally supposed that there is some kind of technological "gap" or "divide" between the two generations - a chasm not easily bridged.

After extensive research of online learning and hybrid delivery models across three major Australian universities (involving varying discipline groups) involving hundreds of students, teaching staff and technical developers, the investigators found in general:

- Little evidence to explain technology usage patterns based on generational differences;

- Assumptions should never be made about what staff or students already know or prefer when designing and delivering any form of online learning, needless to say this goes for assumption about technology skill levels as well;

- For success in the educational field the investigators concluded, it is critical that pedagogical, technical and administrative issues be aligned when implementing emerging technologies for learning;

- If an innovative technology is to be implemented it is vital that new learning and teaching skills are developed in both the target learners and the educators.

In this major study it was also found that the majority of students (83.3%) used the web to access university services", including audio visual content, however "*a sizable proportion of students did not believe that popular technologies such as instant messaging and social networking would be useful for their university study*". While most students had a mobile phone and relied on them for voice and text communication, and were highly skilled in their use, not all students wanted to use them for university work *("... my phone is like my personal life and my education is separate ...")*. This is supported by similar findings by Anagnostopoulou, Parmar, and Priego-Hernandez, J. (2009) and, similarly, Franklin and Van Harmelen (2007). Of the 239 students evaluated, those who reported that an online activity helped them understand material being studied "*was only*

*slightly higher than the number who didn't*" (Kennedy, 2009, p.54). What is clear from this research is that one size does not fit all and the findings are mixed. It is interesting to compare this recent research with other research of online learning

Kirkwood (2009) in an extensive review of evidence from online learning studies concludes that "*throughout western societies, there is much evidence of technology-led innovations within Higher Education (HE) failing to achieve the anticipated transformations in learning and teaching*", to which he attributes two major factors: firstly, differences in students' expectations and understandings of "learning" (likewise their educators) and secondly, "assessment"- that is students are more instrumental and assessment-driven in their online learning behaviour because of the calls on their time because of work and domestic responsibilities, also in order to survive in the system students need to be selective and choices they make regarding assessment are important. (Kirkwood, 2009; Kirkwood & Price, 2005).

In another earlier study of expected and actual use of an online learning environment designed for working masters level engineering students it was discovered that although students found the online learning facilities a valuable resource (Beasley & Smyth, 2004):

- Students preferred to work through online materials in a linear mode;

- The online discussion board was not used, chances to interact with staff and peers ignored (despite the fact that this resource was requested from students in a requirements specification);

- Self-assessment (quick quizzes) and worked examples were much used as they aided understanding and learning.

Interestingly the researchers remark that the expectations of educators is not always in line with student requirements.

Two early major studies ( Hiltz, 1995; Hiltz & Wellman, 1997) of online learning or virtual classrooms over a two-year period investigated a range of courses including full online courses, as well as hybrid or blended courses across a number of discipline groups, including information systems, mathematics, English composition, management etc. The first study was carried out in 1986. A second study in 1993-1996 investigated the effectiveness of online learning in an information systems and computer science program (including videotaped lectures).

The studies found that the majority of students reported online learning to be more convenient, with better access to academics, just over half of students reported they were more motivated in their assignment work. The researchers conclude that virtual classrooms enable anywhere, anytime interactions across geographical boundaries and overcome time constraints.

In the same studies, the researchers found that:

- Just over half (52%) of Virtual Classroom students procrastinated, avoiding logging on to the learning site and leave studying to the last minute;

- The researchers concluded that the larger problem of information overload in an active online class remains to be solved;

- Where the majority of students form new friendships in a traditional class, only 33% of e-learners do so;

- It is difficult to control and deal with antisocial behaviour where there is a large online group, (one on-line class of 96 students was found to be too large), and therefore limits to online class sizes were found to be more social than technical.

It is not surprising that the investigators noted that the technology is still "young", and that there are still many unresolved issues and problems related to the deployment of online learning systems in universities of which staff and student training is just one facet. They call for more research and recommend more case studies about how these technologies are being used, how they are affecting pedagogy, including teaching staff, support staff and students. (Franklin & Van Harmelen, 2007). Kirkwood (2009) concludes his extensive review of the evidence and literature of online learning by calling for further studies of "*how applications, tools and systems are actually being used by students in their required learning tasks and activities, and how these relate to learners' everyday uses of digital technologies.*"

It is our contention that the mixed outcomes of studies of online learning often jump from "students say this in a survey" to "this is the effect on students." In this study, rather than surveying students, we have studied their behaviour by looking at the frequency, duration, and times in which students were logged onto the system and the resources they spent this time with.

## *Method*

Two common methods for studying the effect of online learning are to survey student attitudes and to measure learning outcomes. These techniques are extremely difficult to interpret and student reflections on their learning often bear no resemblance to their performance, and learning outcomes are very dependent upon the talents and effort of a particular student cohort. A study by Wong and Tatnall (2009) used both of these measures and found initial positive improvements in a course quickly declined over time.

Cohen and Nachmias (2006) propose that learning can also be measured via Website analysis and cite McLaughlin, Goldberg, Elllison and Lucas (1999) who claim that such analysis does not suffer from bias "due to self-report methods". Measurement from the analysis of server log files can be a useful tool to understand an "audience" as it is almost a census of site activity, where page by page counts of traffic can be studied. On the negative side, not all activity is logged on the server because of local, proxy, ISP and regional "caching", and "*little is known about the entity requesting the file*" (Coffey, 2001).

Learning management systems (LMSs) or course management systems (CMS) such as Blackboard, WebCT etc., have been implemented across universities and capture and store large file logs of student online activity including users' interactions, number of visits and resources visited.

This investigation draws conclusions about the motivation of students based upon their interaction with the web-based materials. In this study detailed web usage logs were available for the courses and all the individual materials mounted on the web. A small subset of the results obtained is presented here to indicate the trends we found throughout the data.

## *Field of Research - Courses at RMIT UNIVERSITY*

All courses at RMIT University are supported by the learning hub. This is connected to the student records system and comes online one week before the commencement of semester. Semesters have 12 teaching weeks and one mid-semester break before a week of exam preparation we call "swot back week"; this is followed by two weeks of examinations, then finally the publication of results.

### Large face-to-face one

*Face-to-face one* is a large compulsory introductory business computing course for all business students and has no prerequisites. There is a very large student cohort for each of the three semesters in a year. All teaching materials are provided to the learning hub and students are required to

communicate with the teaching team either at tutorials or using the discussion board within the learning hub. Students have a one hour face-to-face lecture, a one-hour demonstration session in a lecture theatre, and a one-hour computer laboratory. The teaching team uses the learning hub for dissemination of all teaching materials, including lecture notes, announcements, assessment specifications, subject guides, staff information, online quizzes, a question/answer forum/discussion board, external links and so on. This course consisted of 420 students in a semester#2 enrolment in 2009.

## Face-to-face two

*Face-to-face two* is an elective course in desktop publishing and business communication without prerequisites, open to all students in the university. In this course all the teaching materials are available to all students, both on the learning hub and on a network drive. Students have a one hour lecture and a two-hour laboratory/tutorial. The teaching team use the learning hub mostly for dissemination of assessment results and the distribution of course content. This course consisted of 218 students in a semester#2 enrolment in 2009.

## Online course

*Online course* was changed to a fully online course during 2008. It is an elective course about the internet in business, with no prerequisites, available to all students in the University. *Online course* was studied over three semesters. In the first of the three semesters studied, the learning hub was used for all teaching materials, and students were encouraged to communicate with the teaching team using individual academic e-mail addresses. Assignments were all uploaded to each student's individual server account, and assessed by the team from that account. Results were then transferred to the learning hub and feedback provided by e-mail. Over the three semesters studied, the student numbers were: summer semester 2009, 41 students, semester#1, 2009, 55 students and semester#2 2009, 41 students, a total of 137 students.

## *Results*

It is often assumed that students will take advantage of online resources by studying at different times that suit them; this is also often cited as an important justification for the deployment of online learning systems. Spennemann (2007) examined server traffic statistics over a number of Australian universities and found that the overwhelming majority of use of university servers took place during office hours (72% between 8 am-5.00pm), principally before two o'clock in the afternoon.

We looked at two aspects of the use of the Internet-based facility available to students in the three courses: *face to face one*, *face to face two* and *online course*. Firstly we looked at the days and hours when students accessed educational materials. Table 1 "*Showing percentage of hits during working hours*" reveals that the majority of "hits" took place during office hours (particularly for the online course), and that the online resources were accessed chiefly from Monday to Thursday.

**Table 1: Showing percentage of hits during working hours**

| Hit Times - between given hours | Courses | | |
|---|---|---|---|
| | Face to face one (420 students) Percentage of total number of hits | Face to face two (218 students) Percentage of total number of hits | Online course (137 students) Percentage of total number of hits |
| | 25,481.00 (total hits) | 18,377.00 (total hits) | 3,733.00 (total hits) |
| % 9.00 am-5.00 pm | 57.9% | 76.19% | 68.77% |
| % outside office hours | 42.1% | 23.8% | 31.23% |
| % 11.00 am-4.00 pm | 43.82% | 58.02% | 55.16% |
| Monday-Friday | 84.82% | 87.61% | 89% |

Table 1 confirms the results from Spennemann (2007) and shows that regardless of the principal delivery method (hybrid or fully online) students mostly study (or access online resources) during office hours. In our case this is surprising in that a significant proportion of the students studying these three courses are working full-time and studying part-time. Another explanation could be that students are working at nights and or weekends.

## Learning hub login patterns

Next we looked at each of the courses to see if there was any pattern in logging into the learning hub. Logins are powerful in that they are direct evidence of student behaviour. They are also a broad measure, as we only know that the student's computer is connected to a particular part of the learning hub. We have only counted logins where the student navigated to some page other than the course homepage. These figures have been aggregated to give totals for each week. This means that a total of 600 logins may be one student logging in 600 times, or 600 students logging in once. This means that hits are an overestimation of the number of distinct students logging in.

## Face-to-face one

Figure 1 shows the pattern of logins for the compulsory core course *face-to-face one*. There were no logins for the week prior to semester when the learning hub was available because students generally are given instructions on how the course is delivered during the first lecture. This chart is vaguely bimodal. There are two major assignments in the course due in week six and 12, and as can be seen from Figure 1 logins peaked one week before each major assignment was due. Students encountering a problem with their assignments are required to report that problem on the learning hub discussion board so that answers to problems are distributed to all students. This process was put in place mostly to make it possible for the teaching team to provide answers to a

very large cohort of students. Inspection of the detailed access in this course shows that 22% of all access was to the discussion board and 61% was to the announcements page (where summaries of answers were kept).
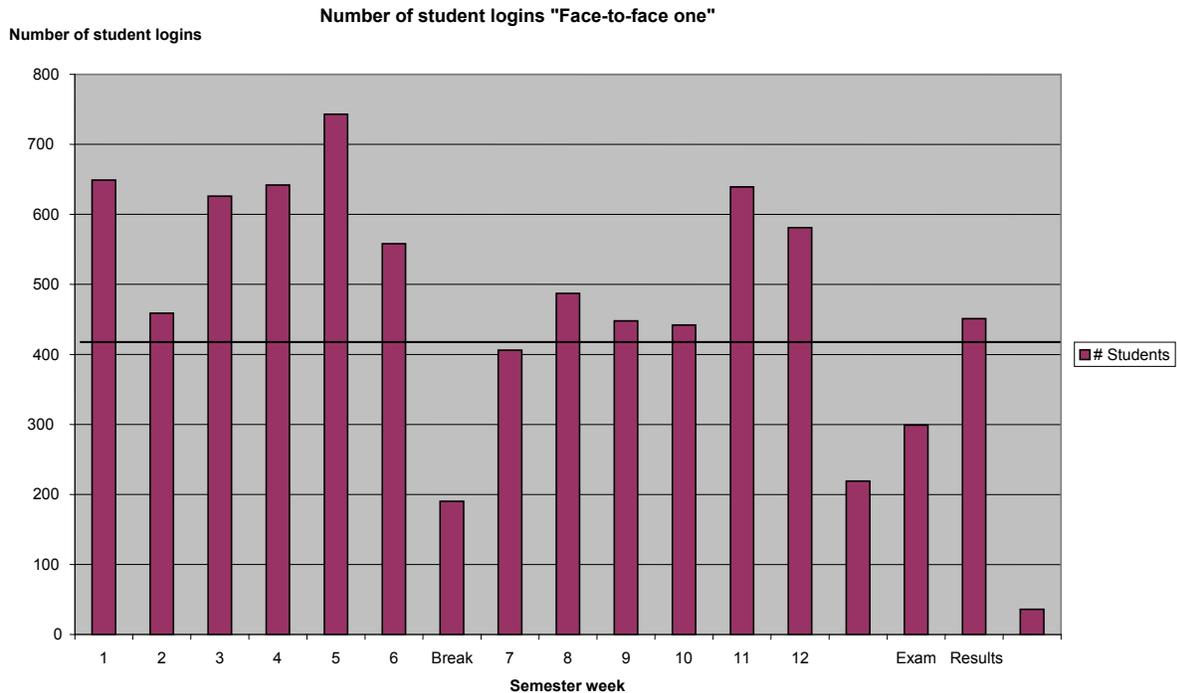
**Number of student logins "Face-to-face one"**

**Number of student logins**



**Semester week**

**Figure 1: Large face-to-face one course showing number of students logging in - 420 students**

## Face-to-face two

The course we call "face-to-face two" has assignments every few weeks, with the major assessment during week 12. Figure 2 should be interpreted in the context of this course making electronic copies of materials available in several forms. In this course 21% of accesses were to the page showing results of assessment, and 53% to the page showing announcements. The announcements page was mostly used to clarify any issues about assessment and the course.
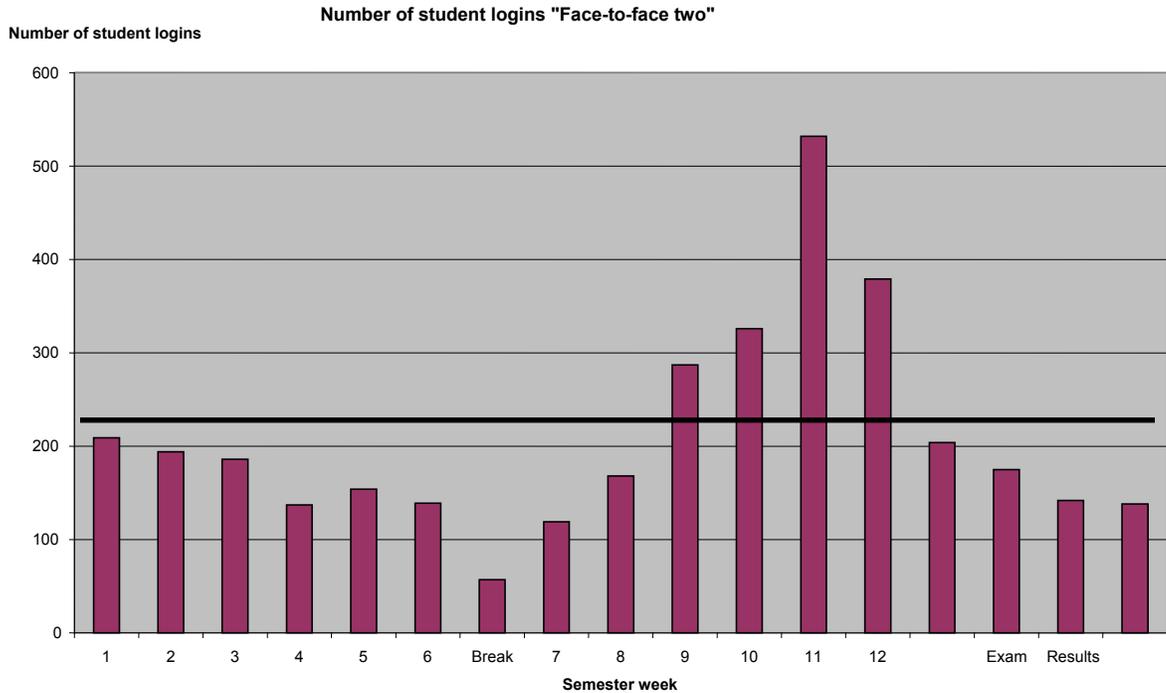
**Number of student logins "Face-to-face two"**



**Figure 2: Face-to-face two course showing number of students logging in - 218 students**

## Online course

For *online course* the first semester studied was that of the summer of 2009. In the Southern Hemisphere the semester starts just after Christmas. The pattern here is the same as the pattern for the other two courses. Figure 3 shows that large numbers of logins occur initially and then again just before assessment are due in weeks six and 12. As with the other courses there are many weeks where some students did not log in at all for the week.

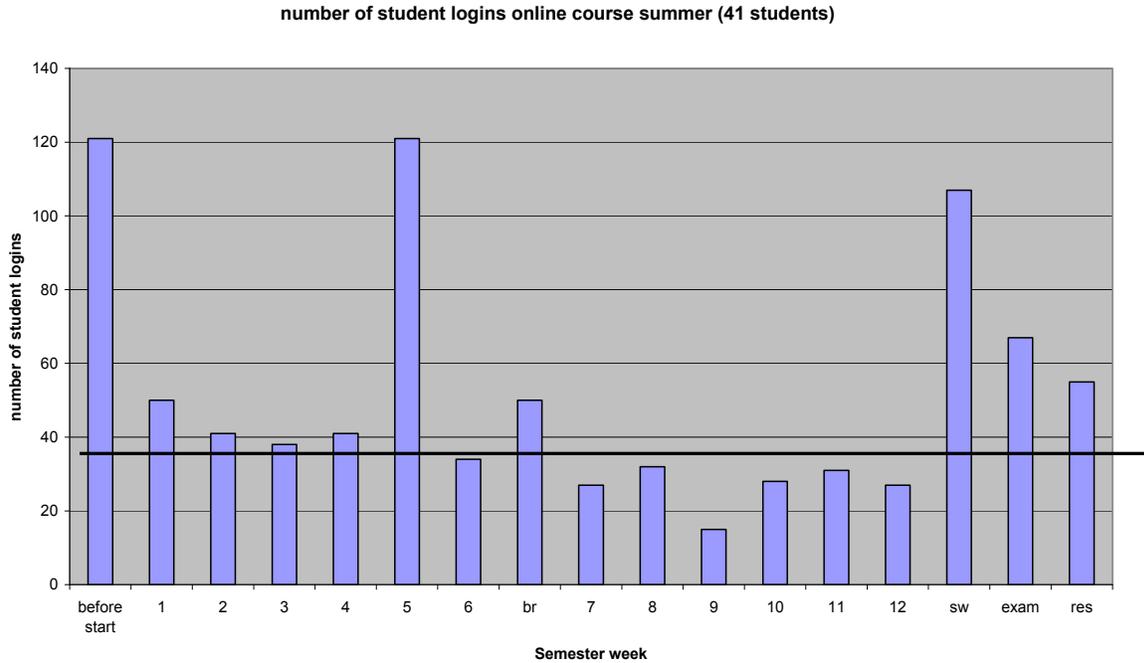**number of student logins online course summer (41 students)**



**Figure 3: Online summer course showing number of students logging in**

This course was followed from summer into the next semester. This semester, called semester 1, is shown in Figure 4. There was an increase in the proportion of students logging in and generally the frequency of interaction with the course. The pattern however is similar to the previous semester. Changes made to the course between the two semesters will be explained in a moment.
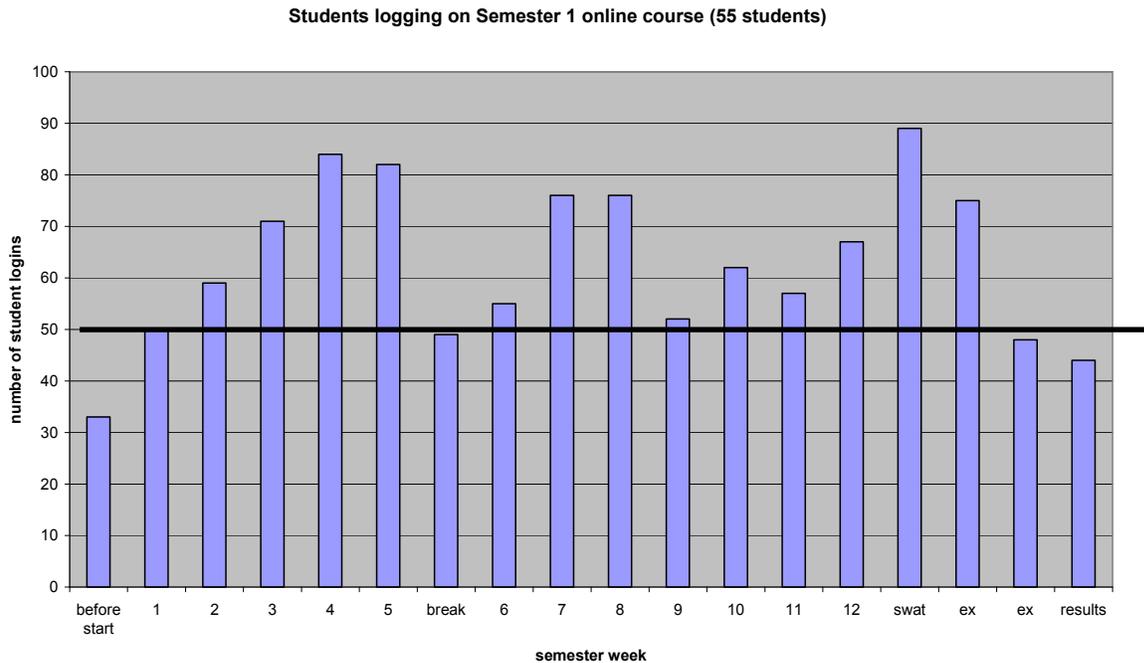
**Students logging on Semester 1 online course (55 students)**



**Figure 4: Online course showing number of students logging in**

In Figure 5, the final semester studied, a remarkably different picture emerges. In the semester all students logged in at the start of semester. Other figures show that the principal activity was to download most of the materials required for the semester. Logins following this initial download period were mostly to the announcements page. Activity on the course e-mail system, which is separate from the web-based learning system, shows steady and sustained increase through the semester. Students appear to have downloaded the material when they feel a need, and then have satisfied their needs by individual contact with the teaching staff through e-mail.
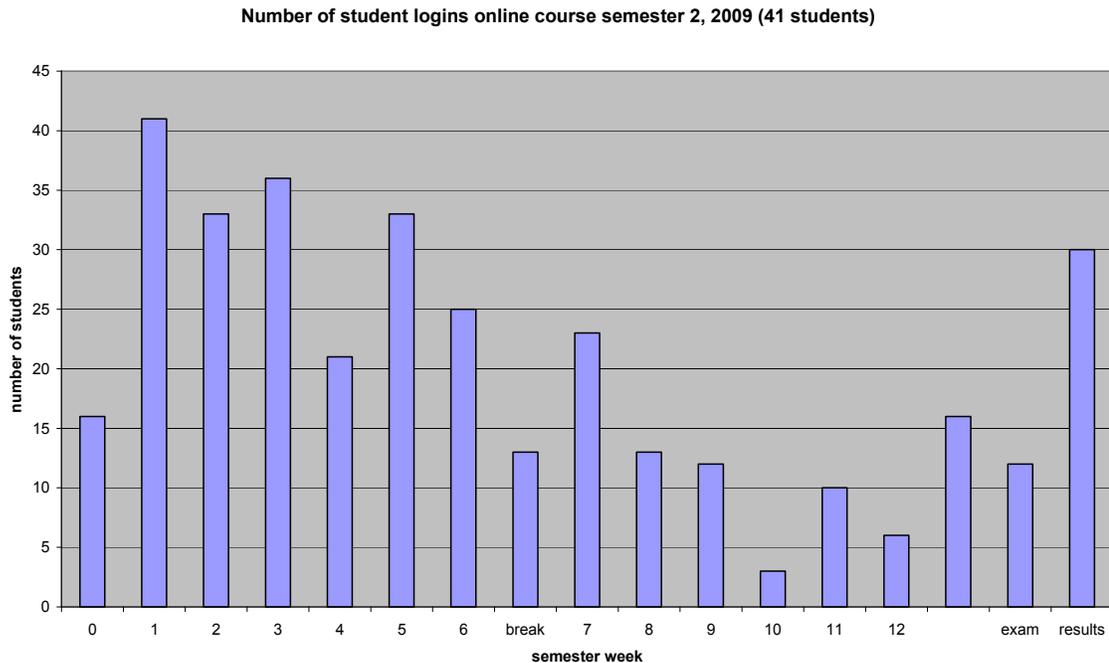
**Number of student logins online course semester 2, 2009 (41 students)**



**Figure 5: Online course showing number of students logging in**

## Introducing an online course

In the first semester the most pressing problem was an apparent lack of involvement from students. This was seen in students not applying for the password for their server account until the week before their first computer laboratory task was due. A significant number of students failed to submit their first assignment. When asked to explain this, several students replied by e-mail asking questions about due dates and other matters covered extensively in the online materials. At the end of semester inspection of the log showed a disturbing pattern of use of the web materials. Many students had not looked at the web-based materials until the day before, or and sometimes the day after, the first assignments were due. Another rash of hits on lecture material took place the day before the exam.

For the second semester offering of the course online, it was decided to implement push e-mails based upon student behaviour. Instead of issuing server accounts to each student, students were sent an e-mail one week before the commencement of semester advising them that they should make contact by e-mail immediately in order to receive their server account. All students not asking for the account by e-mail by the end of the first week were sent another e-mail asking why they had not responded. At the end of the second week all students who had not logged into the system, and those that had not yet asked for a password, were again e-mailed. At the end of the third week students without logins or return e-mails were sent an e-mail advising them that the

best course of action was to withdraw from the course. By the time of the due date for the first assignment only two students had failed to login and obtain a password. Although the teaching team saw this as a success, careful inspection and comparison of logging data against student performance showed that several students did not pass the course after having failed to access critical resources on the Internet.

In the first semester assignments were changed so that students were required to seek permission for the topics that they intended to write about. This required students to interact with the teaching team sometime prior to submitting assessable work. Throughout the semester, the number of points at which it could be determined that students were not interacting with the course, push e-mails were sent. At every point silence from the student caused e-mails to be sent. This process increased markedly the amount of work required to deliver the online course. In order to cope with the increased workload personal e-mails of academic staff were removed and replaced with a single e-mail address for the course. This enables anyone in the teaching team to respond to student e-mails in a timely fashion. The introduction of regular push e-mails to students did not stop students from ignoring the study program. However, it did enable the teaching team to identify non-working students, to issue regular reminders or warnings to them, and to let the students know the problem underlying their failure in the course.

There are a number of anomalies remaining. The most difficult assessment material in the course has a due date a week before the final examination. In the face-to-face versions of this course students were often absent from lectures at the end of semester, as they focus their effort on completing the assignment. It was found that, although the first lectures were accessed by all students who completed the course, the last lecture was accessed by only five students. For the next semester we will be implementing a diagnostic test after every two lectures. This test will carry a small contribution towards the examination result.

### *Online Course Patterns of Hits - Results*

There were large numbers of hits for announcements, tutorial files, and assessment details across the three semesters for the *online course*. This is also true for the two courses that are face-to-face with online support. There was virtually no use of peer-to-peer communication facilities such as the discussion boards, group areas, and other facilities intended to create a cooperative work environment for the students.

Online lectures were accessed early and then just before the exam but later lectures had very few hits. Again this is true of the face-to-face courses.

As the push e-mail system was introduced across the three semesters the levels of student access to the system increased marginally, but access happened much more uniformly and earlier in the semester.

# Conclusion

Why is higher education using online learning systems? Some universities argue that online education will afford more flexibility in access for students, 1 in 4 students regularly miss classes, some students are less engaged in campus life, some forms of online learning will be more cost effective in given situations, there are also claims that online learning will increase the quality of learning experiences.

How often and when do students log on? Our study has found that students do not seem to be choosing online delivery as a method of making their studies more flexible as they mostly were accessing resources during office hours, roughly confirming the findings of Spennemann (2007).

Interesting future research could be directed at determining why are students accessing online learning during work hours and why is the system little used outside of normal work hours.

How are students using online learning resources and which online resources attract the most activity? Are students more assessment focused or learning focused? The heavy concentration on material directly related to assessment and the tendency to put time into the course only near assessment time leads to some speculation about the motivation of online students. The phenomenon does confirm the findings of Kirkwood (2009) who found that assessment driven behaviour in online learning is a major contextual factor. Our study also found that student behaviour was more instrumental.

The provision of richer materials and opportunities for online discussions with their peers and teaching team members was completely ignored. This parallels the outcomes of a study of expected and actual use of an online learning environment designed for working masters level engineering students (Beasley & Smyth, 2004), also non-use or little use of discussion forums confirms other similar findings (Burr & Spennemann, 2004; Spennemann, 2007).

Performance across the three semesters for *the online course* showed marked improvement. This is measured in terms of both the timely completion of assessment material and the quality of that material. The principal change between semesters was the use of push e-mails. It appears that students studying online require vigorous personal input from the teaching team. This outcome confirms the work of others who conclude that for conceptual reflection to happen, learners need prompting from an instructor (Nicols, 2003; Ravenscroft, 2001).

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