Assessment driven learning

by

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Abstract

The problems that first year students and their tutors face are well documented. The student group is non-homogeneous, and most students are essentially part-time. Tutors are caught in the trap of trying to maintain standards and at the same time, improve progression rates, against a background of poor student attendance and performance. There is evidence to suggest that if students receive continuous sympathetic feedback their performance and satisfaction increases. It is also a fact that attendance at computer labs has been substantially higher than at lectures and paper tutorials. This paper describes the operation and initial results in a pilot study to investigate whether it was possible to capitalise on these two points in order to improve progression rates.

Introduction

The problems faced by first year undergraduates are not new. "Enquiry into student progression" published by the University Grants Committee in 1968 noted that large numbers of undergraduates left university by the end of the first year and in 1980 the lack of motivation amongst first year students was explored in detail. (Beard). Tutors have battled to balance the maintenance of standards and the pressure to maintain progression rates. Syllabuses have been analysed and pared so that all non-essential material has been removed. When the student grant was phased out and tuition fees were introduced the problems faced by both lecturers and students increased. The consequence of the number and timing of the hours that most students needed to work to earn money to support the increasingly sophisticated and expensive lifestyle, was that attendance at lectures and tutorials fell. Contact between lecturers and students decreased at a time when the background and skills of the student body was falling. Inevitably progression rates fell. At Glasgow Caledonian University it was the service classes taught by the Mathematics Department where the problems were most acute. Lecturers reported that many students appeared unmotivated. The behaviour of students in one such class was analysed. It was noted that attendance at lectures and tutorials was poor whereas the computer labs were well attended. The decision was made to adapt the delivery of the module to capitalise on the willingness of these students to engage with the computer.

Not many of the students in these service classes found that "learning was an intrinsic motive, which finds both its source and reward in its own exercise"(Bruner, 1966). The revised delivery for the module was designed to engender a "positive orientation towards learning created by the repeated experience of successful learning activities (Entwhistle). The system would also allow for the early identification of students who had difficulties so that assistance could be provided.
Planning and operation

The schedule for the module was changed from three lectures, one tutorial and one lab to two lectures and three labs. The software used was CALMAT. Learning plans with hot links to interactive computer-based learning material and computer delivered questions were created. These could be accessed via the web or could be downloaded by students who had the software at home. See Fig 1 for an example of part of a learning plan.

The learning plans contained text references, interactive computer based questions and hot links to computer-based learning materials. Each question had random parameters, a hint, a full solution and a re-randomisation button. Fig 2 shows a screen shot of a typical question.

Clicking on the question mark icon reveals a hint, the book provides a full solution and the double arrow refreshes the question displaying a similar question with different parameters. The question is judged immediately on input via the pencil icon. The supervised, closed-book computer-based assessments were delivered in 10 of the twelve weeks of the semester, each one worth 8 marks. Each assessment consisted of up to 10 of the assigned questions, delivered by the test manager. The hint, solution and refresher options were not available to the student during the test.
Fig 2 - Example of question

The test results were immediately visible to the students on completion of the test. In addition, the student is able to view the solution to the test questions at this point. This way the assessment became an integral part of the learning.

The remaining 20 marks for the module were awarded for the completion of the computer-based lessons. Each section of the material contained learning material, tutorials with random parameters and assessments. Fig 3 shows a page from a lesson on solving equations involving logarithms.
Fig 3 - Sample of learning material

The learning plans contained equivalent material to that delivered in the lectures. This was done because we recognised that attendance at lectures would probably not improve.

An exemption from the final examination was granted if all the tests were undertaken, all the components of learning material were attempted and the score was 70 or over.

Initial results
Student satisfaction was high and the number of exemptions is over 80%. This compares very favourably with pass rate at the first diet in 2000/2001 of 54%. The final written examination is at the end of January.

Problems and lessons learned
There has been ongoing work on the university network for the whole of the first semester and this has caused some problems. Two tests had to be rescheduled, and on occasions the network was erratic which caused some corruption of results. This was not a serious problem since the student records were backed up daily. The network problems should not occur when the re-cabling of the university is complete.

Attendance at lectures has not improved. At a Staff Student Consultative group it was suggested by the students that lectures should be optional and we are considering this.
A significant minority of students were unclear on how the exemption scheme operated. We had anticipated this and had arranged that the students would be given this information face to face, in paper form and on the module web-page. The operation and assessment scheme were explained face to face during registration week and at labs and lectures during the first week. Each student received a handbook and had access to a web-page to which a frequently asked question section was added when we realised that some students did not understand. At this point we are not sure how to resolve this problem. It has been suggested, half seriously that the first test should be questions on how the module operates, and how to gain an exemption.

References