

The Use Of Web-Based Delivery For First Year Engineers

J.A. Rossiter, Department of Automatic Control and Systems Engineering and D Rossiter, Learning and Teaching Development Unit, University of Sheffield

Abstract

This Case Study discusses work in the University of Sheffield which focuses on overcoming poor study practices, and hence progress, of many 1st year students. Primarily the department wanted to embed incentives which encouraged regular study patterns and also developed mechanisms which enabled effective monitoring of progress by staff so that we could identify and support struggling students. Secondly, the department wanted a test case on which to evaluate the potential of VLE technology for enhancing teaching delivery.

Background

The department was finding a regular pattern of poor student learning/performance and hence poor progress in the first year; this was characterised by an admitted lack of regular work. This led to the development of a project, part supported by the University's learning and teaching development fund, with the main aim: "To improve the students' learning experience, and pass rates by exploring and implementing innovative learning and teaching methods within an engineering context". There was also a desire to give students more independence in their learning, by facilitating automated feedback where this was possible and by more rapid access to the lecturer where this was not. However, for any developments to have the potential for rolling out more widely, it was essential that the ongoing demands on staff time were relatively small. Fortunately, The University of Sheffield had recently purchased a VLE (WebCT), and hence it was decided to investigate in what ways this could be used to achieve the potentially conflicting aims of limiting demands on staff time while improving the learning environment for students.

Methodology

A blended teaching approach was adopted with didactic lectures plus resources available within WebCT. The backbone of the project was the introduction of regular computer aided assessments (CAA) constructively aligned with the key learning objectives of the module. Students were given access to the question database throughout the term, to encourage them to familiarise themselves with the type of question in readiness for the actual tests (held in weeks 5, 8 and 11); of course the underlying intention is that the students practise to maximise their score and hence are learning key facts and how to apply them by repetition. The department can monitor how often they are accessing the VLE, which resources they access, their performance and hence quickly identify those performing poorly.

Other resources included in the project were: (i) date released materials such as tutorial answers and gaps from the lecture notes (to encourage students to log in regularly); (ii) a discussions board checked daily to encourage students to share problems and to facilitate rapid access to the lecturer and (iii) animations with voiceover in order for students to review some of the course material.

Issues

There are several barriers both to creating innovative teaching materials and to using a VLE. The most obvious are inexperience and a lack of shared resources.

More importantly however, the workload implications are substantial. For this project a teaching assistant was hired for 6 weeks to help create an initial CAA question database; their assistance was essential. It also took a Macromedia Flash expert 3 weeks to generate just 13 simple and brief animations (due to the difficulties of including mathematics). It should also be noted that using a blended teaching approach and CAA does not reduce staff workload in the long term. In addition to routine maintenance of the VLE site, annual reflections may indicate the need for significant updating or even new resources; this is on top of the usual talk and chalk lecturing which is remaining an integral part of the overall blended approach. So staff are committing themselves to better student learning and better quality monitoring, but at a cost to their own time.

As both staff experience and the number of quality resources increases it is hoped, there will be more potential to share good resources across the whole academic community.

It was interesting to note that some resources were significantly underused (Rossiter et al 2004b). For instance the discussions board – many students read nothing and very few made any postings. We believe we have some understanding of why this is and changes to the blended teaching approach adopted are being tried as part of current trials.

Benefits

The CAA has been very popular every year except with a small minority of students (generally frustrated at losing marks for nearly correct answers). The students were also very enthusiastic about the active use of the VLE as this enabled them to access the resources when it suited them. Of particular benefit to the department was the high student participation and the ease with which we could identify and follow up students who were not participating; so far in 2004 by chasing students as required, only 2 students have failed to complete all the three coursework assignments to date. Hence, as well as the majority of students performing better, we also believe the blended approach has enabled us to encourage and retain some students who may otherwise have dropped out. We are now investigating how to extend similar automated participation and student tracking more widely across the curriculum, so that we can tackle the progression issue across all modules. We hope to report on this project in 2005.

Evidence of Success

The project was evaluated with 2 separate cohorts of students (Rossiter et al 2004, Jackson 2004). In summary : (i) the module average mark moved to within our aspirations of 55-65%; this is not the case for several other technical modules taken by the same students; (ii) students liked the blended delivery and recommended we keep it; in fact they asked for more of it in other modules; (iii) students particularly liked the CAA and the fact that all resources were available anytime (iv) the availability of immediate feedback (self-assessments) and swift response (via the discussion area) were also positive. Early indications are that this project is being received well by the students.

The other aim of evaluating new teaching methods and a VLE with the intent of rolling out good practice more widely has also been successful, several other staff within the department have adopted the VLE and are using it imaginatively. Moreover, a recent departmental policy decision was taken that every module should make lecture notes available on the VLE. The department is currently looking at ways of adopting best practice (using a constructivist approach) across the entire first year.

Reflections

Not everything you try will work as you envisaged so you need to be prepared to change and be actively involved in the developments. Engaging with the students as much as possible can help to understand their experiences. Our students have asked for more developments like this and hence we believe that, at least broadly speaking, we are moving in the right direction.

Students, in all years, (and staff) are often unfamiliar with VLEs and need continued reminders and guidance to log on and get started. Having a networked computer available during lectures can allow demonstrations and we found substantially more problems when this was not possible.

References

Rossiter, J.A., D. Rossiter and G. O'Brien-Diercks, 2004, *Experiences in the use of web-based delivery for first year engineers*, Proceedings of the Web-based Education Conference, Innsbruck, Austria.

Jackson, D., 2004, *Final evaluation report of a project 77 funded by the Learning and Teaching Development Fund*, The University of Sheffield, LDMU, 5 Favell Road.

Rossiter, J.A., and D. Rossiter, 2004, *Student usage of web-based resources for engineering teaching*, UKACC 2004