Computer-based Test

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Abstract

All students are tested via two computer-based tests each consisting of 10 multi-choice questions (MCQs). These tests are set from a large bank of questions using the 'TAL' (Teach And Learn) computer system developed at the University of Bristol. The topics covered include arithmetic, algebra, geometry, functions, calculus, and probability. A 'leave unanswered' option is provided and negative marking used to discourage guessing. The tests are accessed through a Web interface, so in principle could be accessed from anywhere. It has been run with large-scale simultaneous access and, although a little slow, is relatively robust.

The Execution

The tests were run for all Engineering Students. They took place in two large computer rooms enabling about 100 students to simultaneously access the tests through a web-browser. Questions in the TAL system have time assigned to them so that in a fully (stratified) random setup students may have (slightly) different length tests. If a student is unsure of an answer they may pass over the question and later return to it. Feedback may be provided for incorrect answers, though of course no opportunity to change the answer exists. This year a new, easier test has been introduced, since students were finding the previous versions too hard. The tests remain available for some time if a student wishes to return to a test following a period of revision.

The Results

The fact that the tests have had to be made easier indicates that the skill level of students has declined. Specific areas of concern are logarithms, probability and trigonometry. There has also been a marked decline in the confidence of students. Students are encouraged to take note of questions they have had difficulties with and to seek out study materials in these areas. Once revision has taken place they are encouraged to retake tests. Walk-in sessions are provided for students to seek academic help, as are support classes to address common problems.

The Barriers

The principal problems associated with the TAL system are the unanticipated lack of familiarity some students have with computers, and secondly the speed of the system. This latter problem can be addressed by having a larger, dedicated server for the TAL package.

The Enablers

The fact that TAL tests can be accessed via the web is a major plus. It means that students can access tests from essentially anywhere and that a wider academic community can in principle participate in, and contribute to, the process of teaching and assessing students' knowledge and skills base. The use of a bank of questions and randomisation allows lecturers to have confidence in an automated assessment system giving fair results for an individual without suffering from the fears of widespread plagiarism.

How Can Other Academics Reproduce This?

The administrators of the TAL system are happy to have wider collaboration and participation in the scheme. By contributing a few questions academics can buy into a share of this much larger resource.

Quality Assurance

The TAL system has been in use for a number of years and has been compared to more traditional methods on assessment and diagnosis. Obviously anyone using it would need to go through some sort of benchmarking process against the ability level of their own students.

Other Recommendations

Participating in web-based systems allows for economies of scale and these ideas should be investigated further.