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# CAA Mathematics Series

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Computer-Aided Assessment (CAA) is likely to become an important form of testing in the next decade. So that our community can debate the issues surrounding this emerging form of testing, the LTSN Maths, Stats & OR Network has initiated a series of monthly articles on CAA in mathematics. You are invited to suggest articles for this series by contacting the series editor Cliff Beevers.

The third article in the series has been written by Michael McCabe of Portsmouth University. Michael has been active in CAA for a number of years and was recently awarded a national teaching fellowship. His article, amongst other things, continues the debate on whether higher order skills can be measured by automatic assessment. A link has been made to this article from the index page <http://ltsn.mathstore.ac.uk/articles/maths-caa-series/index.htm>

The introduction to this paper is reprinted below. This is designed to be provocative so please read it and be provoked! Send your comments to the discussion list [maths-caa@jiscmail.ac.uk](mailto:maths-caa@jiscmail.ac.uk) so we can debate thoroughly the issues and strategies for the introduction of CAA.

Once upon a time a teacher was the “*sage-on-the-stage*”. Talk and chalk were the primary educational tools for communicating in the classroom. Resource-based learning, from handouts to interactive CBL, from on-line courses to CAA, has made the teacher a “*guide-on-the-side*”. Indeed the role of the teacher has increasingly become a “*guide-on-the-outside*” as learning technology advances. The teacher becomes simply an identifier or developer of resources: handouts, books, CBL, CAA or Web-based courses.

In the early 90s it was believed that CBL would provide a cost-effective solution to teaching. Students would get on with their computer-delivered study under the direction of their teachers. Time saved could be spent on research or in developing more computer-based learning material! It was soon recognised that CBL could contribute to the quality of teaching, but that it was no panacea. On-line courses have added new elements, allowing a range of communication tools and wider access, but the teacher still sits on the touchline or well back in the stands.

CAA is possibly a cost-effective solution for summative assessment of large classes, although it is rare for its full costs to be identified. While there have been many advances in CAA and adaptive testing may hold promise for the future, CAA should not be limited to second generation computer-based (or first generation OCR/OMR) delivery. A revolution in interactive classrooms, incorporating group response systems, heralds a third generation of CAA. This type of face-to-face CAA presents a challenge, because it makes the teacher the “*guide-on-the-inside*” and requires human rather than computer adaptation.

By enabling the delivery of teaching by questioning, this emerging technology helps support the role of the teacher as “*guide-on-the-inside*” or even “*inspirer-for-the-enquirer*”. The following paper describes some recent use of both on-line CAA and group response systems. It is suggested that we should focus more attention on face-to-face CAA rather than computer-based CAA. At the very least we should broaden the scope of what we mean by CAA to include group (audience) response systems. With the aid of interactive classrooms we can teach happily ever after ...

The fourth article in the series relates to Computer-Aided Assessment in relation to Learning Outcomes, and has been written by Duncan Lawson of Coventry University. In this paper attention is drawn to some of the problems inherent in computer-based assessment in mathematics. In particular the dangers of the assessment medium either distorting the learning outcomes being assessed or introducing extra learning outcomes into the assessment process are discussed. Finally some thought is given to the role of computer-aided assessment of higher level outcomes, reviewing current practice and posing questions for the future.

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## Brief Courseware News

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**Design Science, Inc. announced the release of MathType 5.0 for Windows...**the professional version of the Equation Editor included in Microsoft Office. This release includes new MathPage technology for converting Microsoft Word documents to Web pages that display and print high-quality mathematical notation.

**An Introduction to Groups CD...**The CD is the first of a series of learning resources designed for individual study of university level mathematics. It uses numbers, pAp axioms. All enquiries to the EBS Trust, Radiant House, 36-38 Mortimer Street, London W1W 7RG, email [mail@ebstrust.u-net.com](mailto:mail@ebstrust.u-net.com)