Applications of computer-aided assessment in mathematics education

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Antti Rasila

Aalto University, Helsinki, Finland

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Abstract

Computer-aided assessment system (CAA) is a piece of computer software, which can be used for assigning the homework (or a part of it) in the Internet. The solutions is then graded by the computer, which also may give the student immediate feedback on his work [5]. Automatic assessment can be used in e-learning or together with traditional teaching (this is called blended learning). In this presentation, I will discuss experiences of CAA at Aalto University [1,2,3,4] and potential future applications of such systems.
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- Automatic assessment can be used in e-learning or together with traditional teaching (this is called blended learning).
- The assessment process can be very simple (e.g. multiple choice questions), or very complex involving an artificial intelligence system. I will focus on the latter case.
The CAA project at Aalto University was started by me in 2006. We have been mainly using a modified version of an open source software STACK originally developed by Chris Sangwin at University of Birmingham.

There is a very recent book about this topic, which contains a comprehensive review of my project:

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- Cost savings, less work to teachers (in the long run).
Applications (present, short term)

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- Deep data analysis for tracking learning processes.
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- More realistic assignments.
Case: European Union project S3M2

- Support Successful Student Mobility with MUMIE” (S3M2) is a project supply online courses for better preparation for university studies in mathematical core competencies by developing web-based bridge materials for students with different backgrounds and nationalities.
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- Bridges into B/MSc programs for STEM students and sets a benchmark for successfully studying at leading European universities.
- Geared towards students from high school, students having completed a bachelor degree at a European or Non-European university as well as persons interested in furthering their professional education.
Applications (long term)

- Guided, nonlinear work flows:
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  - Computerized adaptive testing (CAT).

- Adaptive exercise assignments (assignments are given based on the past performance).
- Game-like assignment flows (i.e. demonstrating competences through simulation).
- Large scale computer-guided online courses.
- Weak/slow interactive information flows.
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References


Links

- http://stack.tkk.fi/demo/
- http://stack3.aalto.fi/
- http://www.s3m2.eu