COMPUTER-BASED ASSESSMENT IN THE FIELD OF EDUCATION: BENEFITS AND CHALLENGES FROM A PSYCHOLOGICAL PERSPECTIVE

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The advent of computer-based tasks in educational assessment came along with a number of exciting, but yet unexploited potentials and developments as well as with a number of yet-to-be-solved challenges. A straightforward example of this development towards computer-based testing is the assessment of Complex Problem Solving (CPS). CPS is a prominent representative of a set or a combination of transversal, domain-general skills, empirically connected to a broad range of outcomes, and recently included in large-scale assessments such as PISA 2012. The assessment of CPS requires computer-simulated microworlds rendering CPS as one of the constructs fully relying on computer-based testing and not open to paper-pencil based assessment. To this end, including CPS in large-scale educational assessments such as PISA widens our scope on the types of skills we are able to assess and, at the same time, poses several challenges – both topics are of general interest and frequently encountered in the switch from classical paper-pencil testing to computer-based assessment in the field of education.

In this talk, I will elaborate on the potential of relating psychological research on CPS to advances in computer-based testing and technical platforms associated with these advances. Additionally, I will present and discuss several possibilities for the exploitation of computer-generated log file data. As an example, an application of methods derived from the emerging area of educational data mining is used to extract relevant strategic behaviour in CPS. These process data are further used to increase our psychological understanding of problem solving processes in educational assessments, telling us much about students' problem solving behaviour and their strategic patterns.

Thus, this presentation is aimed at highlighting potential venues of further inquiry on the overlap and future developments of computer-based assessment and education in general and in the specific area of CPS. That is, the potential of creating comprehensive, computer-based assessment instruments and to utilize process data and test-taking behaviour is analyzed against the background of open questions, technical challenges, and equivalence issues coming along with computer-based testing such as in CPS. These topics are discussed on a specific level and on a general level including the IT, the psychological, the educational, and the psychometric perspective.