

adjusting teaching and learning processes to students' individual needs.

The assessments did not cause difficulties; time on task analyses indicated that students were motivated and attentive throughout the testing sessions. The tests proved to be highly reliable with good Cronbach's alphas (.90, .89, .94, .90, respectively). Confirmatory factor analyses were conducted to test the underlying measurement models for inductive reasoning, early literacy and early numeracy tests; they indicated good model fit in general.

The participants of the study were 5996 pupils drawn representatively from the school entering population of Hungary. The instruments were four online tests: an early literacy and an early numeracy test, a test to assess pupils' ability of following instructions and an inductive reasoning test. Pupils completed the tests in their own schools using the locally available computers in four sessions.

The first school years determine later achievements but teachers of these pupils face the difficulties that there are large developmental differences within the classrooms in a number of dimensions that are mostly invisible for simple observation. Without objective instruments to identify pupils' deficiencies the possibilities of differentiated personalized teaching in heterogeneous classrooms are limited. The purposes of this study are to devise an easy-to-use online diagnostic test-battery to assess pupils' precursor skills relevant for successful learning, to examine its applicability in general educational settings and to explore its psychometric characteristics.

### **Online Assessment of Inductive Reasoning and Its Predictive Power on Inquiry Skills in Science**

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The objectives of this study were to develop a computer-based assessment tool for inductive reasoning and to explore the predictive power of inductive reasoning on inquiry skills in science. The sample for the study was drawn from fourth grade (N=5017, age M=10.26, SD=.49) students in Hungary. The online inductive reasoning test comprised 56 items with four subtests: 20 figural series, 21 figural analogies, 8 number series and 7 number analogies. The inquiry test consisted of 13 tasks with 32 items assessing different types of inquiry stages: identifying research questions and hypothesis, designing experiments, interpreting data and drawing conclusions (Cronbach's alpha=.80). The data collection for the inductive reasoning test was conducted in Autumn 2014. A year later we administered the inquiry test on the same sample (N=3338 for both tests). Measurements were carried out via the eDia system in the schools' ICT rooms. Our online test for assessing inductive reasoning proved to be reliable: Cronbach's alpha=.93 for the entire inductive reasoning test and the indices were .83 for figural series, .85 for figural analogies, .73 for number series and .70 for number analogies. Empirical evidence for construct validity was also provided: the four dimensional model had the best model fits where all subtests represented different factors (Chi-Square= 5507.24 df=1478 p

### **Automatically Analyzing PISA Text Responses: Reading Gender Gap and Trends across the Mode Change**

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This study analyzed student text responses to a reading test using natural language processing techniques. Focusing on semantic response features, it investigated (i) the reading gender gap and (ii) trends in the Programme for International Student Assessment (PISA) from 2012 to 2015 alongside the change from paper-based to computer-based assessment. The study demonstrates how text responses can be a new source of information enriching the core constructs like it is typically done using process data. For this, a theoretical framework from previous work was used that allows mapping of response features to the preceding cognitive components such as micro- and macropropositions in the situation model. In total, n = 33,604 responses from the German PISA 2012 sample and n = 9792 responses from 2015 have been analyzed in order to characterize the genders' cognitive types. This abstract only describes the results for PISA 2012 due to the data embargo for PISA 2015. The results for 2012 showed that girl types used more propositions (2.8–4.9) from the situation model, irrespective of the response correctness. They integrated relatively more relevant propositions and more successfully adapted to the level of the question focus and category. It appears that boy types struggle with retrieving and integrating propositions from the situation model while girl types liberally juggle these to formulate their responses.

### **Computer Adaptive Learning Preparedness Test (CAT-LPT) for Vocational Upper Secondary Education**

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In Finland, students with special education needs or lacking or incomparable school grades can opt for an alternative method to apply for upper secondary education instead of participating in the report-card-based student selection. To facilitate the placement of students with special needs and to organise them support for completing vocational studies, national educational authorities gave an assignment to a university research centre to develop a computer adaptive