THE FEASIBILITY AND RELIABILITY OF COMPUTER-BASED ASSESSMENT OF INDUCTIVE REASONING IN NAMIBIA AND CHINA: A COMPARISON STUDY

Hao Wu *, Linus Kambeyo *, Gyöngyvér Molnár **

* Doctoral School of Education, University of Szeged
** Institute of Education, University of Szeged

In recent years, a large number of studies have highlighted the importance and benefits of computer-based assessment (CBA; Csapó et al., 2012). A broad range of instruments, including observation protocol, tests and item banks, are available which can be used to assess different aspects of general cognitive development including reasoning skills which learners are expected to master at school (de Konig, 2000). The goal of our study was (1) to examine the feasibility and reliability of computer-based assessment in Namibia and China, in two culturally and infrastructurally different countries and (2) to compare students' development of inductive reasoning, the developmental level of which strongly influences the success of knowledge acquisition and application (Molnár et al., 2013), and thus the effectiveness of learning. The data collection was conducted in Namibia (N=621; 268 boys; 348 girls) and China (N=50; 27 boys; 23 girls) via the eDia platform in June 2016. Both the Namibian and the Chinese participants were average 12-year-old students (Namibia: age mean=12.40, SD=1.19; China: age mean=12.28, SD=.50), but it in Namibia, they were 5th and 7th graders, and in China, 6th graders. Students had 40 minutes to complete an online test measuring inductive reasoning. The test administered in Namibia consisted of 66 items, while the test prepared for Chinese students contained 53 items. The test versions contained 42 anchor items allowing achievement scores to be represented on a single scale. Both instruments comprised four subtests: figural series, figural analogy, number analogy and number series. The Rasch model was carried out for scaling the data. The reliabilities proved to be high in both countries (Cronbach's alpha for Namibia: .846; China: .725). Test completion did not mean any problem for the students in either country. Chinese students highly outperformed (M=2.17, SD=.83) Namibian students (M=-1.38, SD=.84) in both test (t=28.684, p<.001) and subtest level (figural series: t=21.063, p<.001, figural analogy: t=16.469, p<.001, number analogy: t=18.859, p<.001 and number series: t=18.536, p<.001). This confirms our hypotheses based on the PISA results of China. There was no significant development detectable between grades 5 and 7 in Namibia (t=1.822, p>.05), which means Namibian students do not have explicit inductive reasoning training in this age-range at school. However, this is the age when almost the fastest development is expected to occur regarding thinking skills (Molnár et al., 2013). There was no significant gender difference detectable in either of these countries. The results suggested that computer-based assessment is feasible and reliable in both Namibia and China even despite the huge cultural and infrastructural differences. Namibian students' inductive reasoning skills are far below the developmental level of Chinese students and are not explicitly enhanced at school, which must be a very important task for the future in the Namibian primary education.