

**THE POSSIBILITY OF AN ONLINE ASSESSMENT OF SCIENTIFIC REASONING,
INDUCTIVE REASONING AND MOTIVATION TO LEARN SCIENCE: A PILOT STUDY IN
NAMIBIA**

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Keywords: scientific reasoning; inductive reasoning; motivation

Of late, many studies have accentuated the importance and benefits of computer-based assessment (CBA; Csapó et al., 2012). A number of instruments, including observation protocol, tests and item banks, are made 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 purposes of this study were to explore the possibilities of online assessment and to investigate the relationship between scientific reasoning, inductive reasoning and motivation to learn science in Namibia. The sample of the study was drawn from fifth (N=275) and seventh graders (N=346). The online assessment tool (Csapó, Korom & Molnár, 2015) for scientific reasoning skills consisted of 36 items with 16 tasks assessing conservation; proportional, correlational, probabilistic reasoning and classification skills in science context. The inductive reasoning test consisted of 38 items: 18 figural inductive reasoning items and 20 numerical inductive reasoning items (some items have been deleted due to low items correlation). The Cronbach alpha for the inductive reasoning was good at .839. The Science Motivation Questionnaire II. (SMQ, Glynn et al, 2011) was also used to explore the relationship between reasoning skills and motivation to learn science. The eDia platform was used to collect the data. Learners were ferried from their schools to the University of Namibia's ICT rooms. Due to the low reliability in grade 5 (Cronbach alpha=.64) we excluded them from further analyses. For grade 7, Cronbach alpha=.70. Both tests were moderately hard for the students, scientific reasoning (SR) tasks being at M=40.56%; SD=13.47% and inductive reasoning task (IR) at M=31.73% SD=16.61%. One-parameter Rasch analyses showed that there were few items to differentiate students at low skill levels. The reliability of the SMQ was good, Cronbach alpha=.91. Average scores were relatively high, thus students reported that they are motivated to learn science. Except self-efficacy, significant ($p<.05$) but weak correlations were found between scientific reasoning and motivation. On the other hand, moderate positive correlation ($p<.001$) was found between inductive reasoning and motivation to learn science ($r=.169$). Results revealed that both reasoning skills tests might need to be revised in order to carry out reliable assessment in this age cohort in Namibia. Further, there is a need for the revamp of the Namibian education system to improve the reasoning skills among the learners. Our findings indicate that online assessment may provide schools and teachers with user-friendly assessment instruments, but for this purpose Namibian education system need to pay more attention on the development of basic ICT infrastructures within schools.