

THE RELATIONSHIP BETWEEN SCIENCE MOTIVATION, ATTITUDE TOWARD SCIENCE, AND INDUCTIVE REASONING AMONG SCIENCE MAJOR STUDENTS IN INDONESIA

T-7

Azizul Ghofar Candra Wicaksono *, **Erzsébet Korom ****

** University of Szeged, Doctoral School of Education*

*** University of Szeged, Institute of Education*

Keywords: science motivation; attitude; inductive reasoning

Inductive reasoning is one of the factors that drive students' intellectual development, and have a positive influence on their learning performance (Klauer & Phye, 2008). Inductive reasoning is important in science education, and can be influenced by affective factors (Spinath et al., 2006). This study examined the role of affective factors (motivation and attitude) in inductive reasoning skills.

146 science major students (87% female; $M_{age}=20.12$; $SD=1.04$) in Indonesia were involved in this study. They completed an inductive reasoning test, a science motivation, and an attitude toward science questionnaire in an online form. The science motivation questionnaire consisted of 25 items in five categories (intrinsic motivation, career motivation, self-determination, self-efficacy, and grade motivation) (Glynn et al., 2011), while the attitude toward science questionnaire consisted of 27 items in four categories (anxiety, enjoyment, participation in science activity, and value of science) (Wendt & Rockinson-Szapkiw, 2018; Summer & Abd-el-Khalik, 2018). The questionnaire used Likert-type items that ranged from 5 (strongly agree) to 1 (strongly disagree). The inductive reasoning test consisted of 32 items in four categories (figure analysis, figure series, number analogy, and number series) (Adey & Csapó, 2012; Pásztor, 2016). A correct answer scored 1 point, and a wrong answer scored 0.

The Cronbach's alpha reliability and exploratory factor analysis showed good results for science motivation ($r=.975$; $KMO=.959$, $p<.05$), attitude toward science ($r=.937$; $KMO=.941$, $p<.05$), and inductive reasoning ($r=.900$; $KMO=.826$, $p<.05$). The mean average of students' science motivation was 3.609 ($SD=0.618$) and attitude toward science was 3.209 ($SD=0.676$), while for inductive reasoning skills it was 0.658 ($SD=0.277$). Inductive reasoning had a positive correlation with science motivation ($r=.308$, $p<.05$) and attitude toward science ($r=.142$, $p<.05$). Regression analysis also revealed that the contribution of science motivation was 10.11% ($r=.308$, $\beta=.318$; $p<.001$) and attitude toward science was 2.03% ($r=.142$, $\beta=.143$; $p=.071$). These variables explained 12.14% of the variance of inductive reasoning skills, and they significantly predicted the dependent variable, ($F(145)=9.884$, $p<.001$). The contribution of science motivation and attitude toward science was not high in explaining inductive reasoning skills. This result is supported by Van Vo & Csapó (2021) who also found that the relationship between motivation and inductive reasoning was not strong. However, there are a lot of other variables in the affective or cognitive area which may explain inductive reasoning skills. Thus, involving other variables is essential for a future study on inductive reasoning skills.