

MODELING RELATIONSHIPS AMONG LEARNING, ATTITUDE, SELF-PERCEPTION, AND SCIENCE ACHIEVEMENT FOR GRADE 8 SAUDI STUDENTS

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ABSTRACT. The purpose of the present study was to examine the validity of modeling science achievement in terms of 3 social psychological variables (school connectedness, science attitude, and active learning) and 2 self-perception variables (self-confidence and science value). Two models were tested: full mediation and partial mediation. In the full-mediation model, effects of the 3 social psychological variables upon science achievement were hypothesized to be completely mediated through science value and self-confidence. In the partial-mediation model, however, those 3 variables were hypothesized to affect achievement directly as well as indirectly through the mediating roles of science value and self-confidence. Data were obtained from Grade 8 Saudi students ($N = 4,099$) who participated in TIMSS 2007. The relationships among constructs were examined with the use of structural equation modeling software Mplus7. Results indicated that both models performed adequately in terms of fit indices, but the partial-mediation model was retained due to its superiority over the full-mediation model in representing the sample covariance matrix as tested through chi-square difference test. The mediating role of self-confidence in the relationships of science attitude and active learning to achievement was substantiated, but the mediating role of science value was not supported.

KEY WORDS: active learning, school connectedness, science achievement, science attitude, science value, self-confidence

The educational system in Saudi Arabia is centralized and performance-driven with the Ministry of Education (MoE) having top-down authority and responsibility for policy, school organization, funding, curricula, and resources. In 2004, public spending on education represented 6.8 % of the gross domestic product of Saudi Arabia, and it tripled from 1970 to 2000 as a percentage of overall spending (World Bank, 2008). Officially, three levels form the education ladder: primary, being compulsory, covers 6 years (age 6–12 years); intermediate covers 3 years (age 13–16 years); and secondary covers 3 years (age 17–19 years). In 2007, the total gross enrollment rate (boys and girls alike) was 98.1 % in primary education, 95.9 % in intermediate education, and 91.8 % in secondary education. Student progress is determined by comprehensive examinations, which are based on the prescribed curriculum and textbooks; the examinations are conducted twice a year under the supervision of the MoE (Ministry of Higher Education, 2006).