

Original Article

Assessing Gender Differences in the Model of Physics Academic Self-concept

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Introduction

The academic self-concept is a multidimensional structure, which can be defined and measured specifically in each field of study. The idea that having a positive academic self-concept can have positive educational consequences is trending. Academic self-concept is an individual's self-evaluation and self-perception of his/her general ability in a specific academic domain. Academic self-concept can play an influential role in one's academic motivation and academic choices. So far, models have been developed for science, followed by instruments for measuring academic self-concept, including physics as a branch of science. If we seek more profound and more effective teaching and learning methods in physics education, our greater awareness of the physics academic self-concept and a better understanding of its impact will play a decisive role in the learning process. A combination of direct educational interventions (such as improving academic self-concept) and indirect educational interventions (like improving knowledge and skills) are among the most successful ways to achieve the desired learning outcomes. Therefore, it is crucial to have a deep understanding of a student's academic self-concept in physics. The study objective was to investigate the relationship between physics academic self-concept and gender differences in Iranian students.

Method

Data were collected from a sample of 603 male and female students in the science-based and calculus-based disciplines of the tenth to twelfth grades of Iranian secondary high schools. Confirmatory factor analysis and psychometric methods were used to standardize the Physics Academic Self-Concept Questionnaire.

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Results

The results showed that the academic self-concept questionnaire has an appropriate structural validity and the relationship between the physics academic self-concept and students' gender is significant.

Discussion

The structure of the physics academic self-concept model was different between boys and girls, and female students had lower academic self-concept scores than male students. It is suggested that gender differences be considered in physics education and the necessary intervention be made to improve the physics academic self-concept in Iranian schools.

Keywords: Physics education, academic self-concept, gender differences, SEM

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