

Gender Differential Item Functioning in a Science Periodical Test of Eighth Graders

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Abstract

This study investigates gender differences and differential item functioning (DIF) in a science periodical test of eighth graders. We selected 382 students (191 boys and 191 girls) from a junior high school in New Taipei City. We calculated and compared the effect size, female/male standard deviation ratio, and female/male ratio. In addition, we used the IRT Rasch model and the Mantel-Haenszel procedure for gender DIF. The results of this study are as follows: (a) in unmatched analysis, no gender differences were observed among all groups; however, boys exhibited slightly better performance to girls among both high-achieving groups (top 10%) and low-achieving groups (bottom 10%); (b) in matched analysis, the intersection of the results using the IRT Rasch model and the Mantel-Haenszel procedure showed that the average percentage of items displaying gender DIF across administrations was low, at approximately 4% (in favor of girls). The follow-up review of these DIF items indicated associations of gender DIF with item characteristics. Furthermore, charts may affect the DIF direction. Finally, this study provides suggestions for items construction and future studies on science.

Keywords: gender differences in science achievement, science gender DIF, science periodical test

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