

**USE OF RASCH MEASUREMENT MODEL IN EXAMINING THE UTILITY OF
TIMSS 2015 ASSESSMENT OF AUSTRALIAN GRADE 8 MATHEMATICS**

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Abstract

The Rasch Measurement Model (RMM) has been widely utilised by the International Association for the Evaluation of Educational Achievement (IEA) since 1995 to estimate the psychometric properties of international large scale assessments such as TIMSS and PIRLS, and to provide student ability estimates in mathematics, science and reading. However, in TIMSS 2015 assessment, the three-parameter model (3PL) was employed for this estimation. The central question to this change is that is RMM still powerful and useful for item and student ability estimation? This study seeks evidence for the use of RMM in examining the utility of 35 Algebra multiple choice questions from TIMSS 2015 Grade 8 mathematics for the Australian cohort. A critical document analysis was conducted to review the application of RMM in test utility of international large scale assessments and research. The association of the item estimates between RMM and 3PL were also examined. The document analysis shows that RMM is a powerful and effective application for psychometric property examination and student ability estimation in all international large scale assessments and research. The correlation analysis shows that item estimates for RMM is significantly, highly and positively related to 3PL, providing evidence that RMM is a powerful measurement model which is capable to provide meaningful information of item estimation.

Keywords: Rasch Measurement Model, Mathematics achievement & TIMSS.
