The Relationship among Self-Concept, Self-Efficacy, and Performance in Mathematics: The PISA 2003 Hong Kong Data

Abstract

The purpose of this study was to examine the relationship among self-concept, self-efficacy, and performance in mathematics. The PISA 2003 Hong Kong data was used as an example. There were 4402 15-year-old participants in this survey. Explore factor analysis was used to identify the good measurement models of self-concept and self-efficacy in PISA 2003. The results showed that the measurement models had high reliability and validity. The other result showed self concept had no direct effects on the mathematics achievement. But under the mediation of the mediator, such as self-efficacy, there was indirect effect on the mathematics achievement. Analysis also showed that the two sets of samples have presented cross validity, the research model is highly acceptable.

Key words: cross validation, mediation, PISA database, self-concept, self-efficacy, mathematics achievement

摘要

本研究目的，在利用 PISA 2003 資料庫為例，分辨數學自我概念、自我效能與數學成就關係之模式的建構。本研究選香港為研究對象，以參加 PISA 2003 的 4402 名香港的 15 歲學生為樣本來進行本研究。本研究運用探索性因素分析(EFA)檢視自我概念與自我效能之測量指標的信效度。分析結果顯示，「自我概念」與「自我效能」的測量模式的建構達良好的信效度。另一研究結果顯示，學生數學自我概念對數學成就之間沒有直接的影響效果，但會透過數學自我效能此中介變項，而產生對數學成就的間接影響效果。此外，在雙交叉驗證方面，顯示研究二組樣本具有交叉效度，研究模式之接受性均相當高。

關鍵詞：交叉驗證、中介變項、PISA 資料庫、自我概念、自我成就、數學成就