

Public Abstract

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Title:The Effect of Reform-Based Science Teaching on SES-Associated Achievement Gap on PISA 2006: A Comparative Study of the United States and Taiwan

The goal of this study is to examine how reform-based science teaching has been implemented and whether reform-based science teaching has promoted education equity through being available and beneficial for students from different socioeconomic status (SES) family backgrounds in the U.S. and Taiwan. No existing study used large-scale assessment to investigate the implementation and outcomes of the science reform movement in the U.S. and Taiwan. This study was developed to fill this gap using the Program of International Student Assessment (PISA) 2006 data including 5,611 students in the United States and 5995 students in Taiwan.

A Latent Profile Analysis (LPA) was used to classify students into different science learning subgroups to understand how broadly reform-based science learning has been implemented in classrooms. The results showed that students in the U.S. had more opportunity to learn science through the reform-based learning activities than students in Taiwan. Latent Class Regression (LCR) and Structural Equation Modeling (SEM) were used for examining the availability of reform-based science teaching in both countries. The results showed that in the U.S., higher SES students had more opportunity to learn science reform-based learning activities. On the other hand, students' SES had no association with reform-based science learning in Taiwan. Regression Mixture Modeling and SEM were used to examine whether there was an association between reform-based science teaching and SES-associated achievement gaps. The results found no evidence to support the claim that reform-based science teaching helps to minimize SES-associated achievement gaps in both countries.