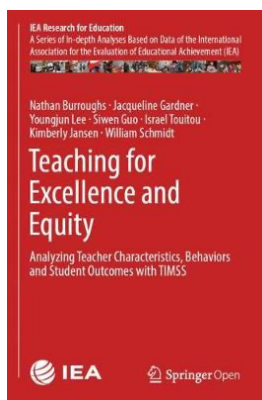


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Teaching for Excellence and Equity: Analyzing Teacher Characteristics, Behaviors, and Student Outcomes with TIMSS

N. Burroughs, J. Gardner, Y. Lee, S. Guo, I. Touitou, K. Jansen, & W. Schmidt,
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This book encompasses the relationship between teachers' effectiveness and students' outcomes, including an emphasis on educational equity. *Teaching for Excellence and Equity* is a comprehensive volume in the International Association for the Evaluation of Educational Achievement (IEA) series that imparts knowledge and provides high-quality data about education systems worldwide. The publication carries the very purpose of the IEA series by supporting educational reforms to lead to a better teaching and learning environment in schools. Specifically, it considers teachers as a vital and integral source and a key to understanding the "black box" of education.

The main source of data that *Teaching for Excellence and Equity* draws upon is 20 years of data collected by the IEA from 1995 to 2015, with deep contextual information used to connect characteristics of teachers, behaviors, and professional development to student outcomes. The book is divided into eight easy-to-read sections. A variety of methods, such as regression and fixed-effects analyses, structural equation modeling, and the evolution of associations over time are described. The initial chapters contain an overall critique of the Trends in International Mathematics and Science Study (TIMSS). The authors discuss the difficulty of measuring teacher quality in cross-cultural educational settings, which is relevant as TIMSS collects extensive information about teachers of different countries like Qatar, Israel, Hong Kong, Canada, the United States, and many others

to examine instructional techniques, educational equity, and the link between characteristics and behaviors of teacher and student outcomes. Teachers play a significant role in shaping students' communication, analytical, and judgmental skills, but at the same time, it is very complicated to define the features or qualities of an effective teacher. According to the comparative research among countries, measures including teachers' experience, professional knowledge, self-preparation, and opportunity to learn are significant for students' achievement.

The third and fourth chapters offer substantive insights into crucial variables. These diverse variables and new tools for TIMSS include student self-efficacy, the instructional position of teachers, and learners' self-reported emotional response toward the subject of mathematics. A multimodal strategy and intricate sampling design applied to analyze data of relevant surveys and different relationships were tested. The results indicate that teacher effectiveness can be separated from the quality of the overall national educational system; the detailed results drawn from IEA trends over 20 years provide an overall image of variation. Further, the findings of Chapters 3 and 4 are that there is not an alignment among the instructional content determined by the individual teacher and coverage of expected or prescribed national content in mathematics. The participating countries' data shows increases in student achievement on TIMMS based on teachers' years of experience, level of qualification, and classroom time. These chapters suggest that teachers should take significant steps regarding classroom time in order to teach effectively.

Chapters 5 to 7 discuss several practical analysis and equity issues. IEA's trends reflect questions about any given teacher's role in manipulating students' outcomes, indicating a focus on possible corruption or "test fixing." A fixed-effects analysis is also explored. Similarly, the effect of different cultural contexts on students, size variation, and directional indicators between cycles raises severe concerns regarding possible impact on teachers and students. The results suggest that student performance and also the quality of the teacher can be measured by differentiating high and low socioeconomic-status classrooms, indicating that relative wealth of the country and region have a strong role to play in student success as measured by TIMMS. Policymakers should carefully draw lessons from one system to another; equity is a vital concern, and an exclusive reliance on spending more instructional time on mathematics to reduce inequalities cannot be the only approach taken.

The final chapter draws attention toward the central aim to investigate what cross-national assessments reveal about teachers' roles in influencing student outcomes, and employs chain analyses to find potential trends in the quality teacher instructional metrics. However, no definite proof linking teacher efficiency and student results is found. On the positive side, many countries see a rise in student TIMMS scores over the 20 years assessed by the IEA in this volume. Perhaps the main finding of the study is that dedicating more time to the teaching of mathematics does seem to improve student performance on TIMMS across borders, while there are inconsistent findings on the impact of teacher quality. The results show that teachers with the same traits may produce different results across distinct national settings, indicating the importance of national and cultural context.

In conclusion, the book develops with eloquent arguments analyses of teacher characteristics and student outcomes. It provides valuable resources to researchers

and it offers sufficient knowledge about teacher quality, education systems, student outcomes, and equity issues. It is also an authentic source to do higher level research of Grades 8 to 12 in the future, and additionally has implications for teacher training programs at the higher education level. Being educational researchers, we find this book essential for both current teachers and students of the teaching field.

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