

Title: Relationship between Constructive Teacher Beliefs and Instructional Practices to Students' Mathematical Achievement: Evidence from TIMSS

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ABSTRACT

The purpose of this study was to examine the relationships between teachers' personal beliefs about how students learn mathematics and their instructional practices to the mathematical achievement of eighth grade mathematics students in the United States. Data was collected from the TIMSS questionnaire completed by five hundred twenty-seven teachers representing 10,970 students.

The general analytic approach to this study was to identify items from the TIMSS teacher questionnaire that appear to closely contain the independent concepts described in the theoretical framework. The review of literature discusses the behaviorist beliefs and instructional practices based on Gagne's theory. Constructivist beliefs and practices will be based on recommendations from the National Council on Teaching Mathematics.

Descriptive statistics describe the predictors of eighth grade mathematics teachers' beliefs and instructional practices. Correlation analysis was used to examine the relationship between teacher beliefs and their instructional practices. Factor analysis was used to examine how the variable cohered. Hierarchical linear regression demonstrated the influence of teacher beliefs and instructional practices on students' mathematical achievement.

Results of the study are discussed in relation to the three dominant purposes of the study, namely: (a) to determine behaviorist and Constructivist teachers hold different beliefs concerning student learning, and if so, these be identified; (b) to determine if behaviorist and Constructivist

teachers employ different instructional practices in the classroom; and (c) to determine if there is a difference in students' learning based on the beliefs and instructional practices of their teachers.

Overall, the conceptual model offered sound guidance for the study. The main theoretical idea- that various dimensions of teacher beliefs and instructional practices effect student achievement in mathematics-received only limited support in the empirical analysis. The findings suggest different dimensions of teachers' beliefs and instructional practices are more closely related to student achievement than others.