

**Public Abstract**

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**“The Effect of Animated Agents with Verbal Audio on Mathematics  
Comprehension and Attitudes towards Mathematics and Computers”**

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The use of multimedia in web-based instruction, particularly in mathematics education, is increasing exponentially and can be an effective form of pedagogy to assist students in the construction and comprehension of mathematical knowledge. To confirm that the latter part of the previous statement is true, researchers must assess students' attitudes towards web-based instruction, computers and mathematics and their comprehension of mathematics. Investigating students' attitudes and comprehension is a crucial step in understanding how the learning environment in mathematics education is affected by the introduction of multimedia in web-based instruction, computers and other technologies.

This doctoral study investigated the effect of animated agents with verbal audio in WBI on mathematics achievement and attitudes toward mathematics and computers using a pretest-posttest control group design model among college students who enrolled in Pre-Calculus courses at a doctoral/research-extensive university. It verified quantitatively that the presence of animated agents with verbal audio in WBI can improve students' mathematics achievement and attitudes toward mathematics, but not their attitudes toward computers. In particular, students in the experimental group practice effect improved, but not their application effect. In addition, this study verified that there exist a positive association between a student's attitude toward mathematics and his attitude towards computers and vice versa, and there exist a positive association between a student's satisfaction with WBI and her attitudes toward mathematics. Designers and developers of WBI can use these findings to better design, develop, and implement a web-based tutorial that promotes positive attitudes toward learning and long-term achievement in postsecondary mathematics education.