

**A COMPARATIVE STUDY OF MATHEMATICS SELF-EFFICACY AND ANXIETY LEVELS OF GRADES 10-12 STUDENTS AT THAI CHRISTIAN SCHOOL BEFORE AND AFTER SUPPLEMENTAL PRACTICE USE OF THE MATHEMATICS E-LEARNING APPLICATION WEBSITE KHAN ACADEMY**

**Brian S. Parsons<sup>1</sup>**

**Orlando Rafael González González<sup>2</sup>**

**Abstract:** The purpose of this study was to determine if students' mathematics self-efficacy could be increased and their mathematics anxiety could be reduced by adding supplemental mathematics practice using the internet-based website Khan Academy to increase mastery experiences in solving mathematics problems. The study focused on 156 Grades 10-12 students at Thai Christian School in Bangkok. A research experiment was conducted during the course of the second semester of the 2016 school year based on Bandura (1977) sources of self-efficacy (mastery experience, vicarious experiences, verbal persuasion, psychological factors). During the experiment, the students received weekly supplemental mathematics practice by homework recommendations from the researcher sent using the Khan Academy website. A comparison was made between the students' mathematics self-efficacy and mathematics anxiety before and after the research experiment and after the research experiment. The research included four objectives. Objectives one and two were to determine students' mathematics self-efficacy levels and mathematics anxiety levels at the beginning and end of the research experiment. Objectives three and four were to determine if a significant increase in mathematics self-efficacy and a significant reduction in mathematics anxiety could be achieved through the addition of supplemental mathematics exercises using the mathematics e-learning website Khan Academy. The major findings in this research were that the average students' mathematics self-efficacy increased, and the average students' mathematics anxiety was reduced in all three-program emphasis (mathematics science, mathematics-English, English-Chinese). Overall Mathematics self-efficacy increased significantly for the entire sample and mathematics anxiety reduced significantly for the entire sample.

**Keywords:** Mathematics, Self-Efficacy, Anxiety, E-Learning, Khan Academy.

---

<sup>1</sup> M.Ed. Candidate in Curriculum and Instruction, Graduate School of Human Sciences, Assumption University, Thailand.  
brainsparsons@gmail.com

<sup>2</sup> Ph.D., Assistant Professor, Graduate School of Human Sciences, Assumption University, Thailand.  
ogonzalez@au.edu