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Ph.D. Dissertation Defense

Entitled

IMPACT OF TEACHING MATHEMATICS WITH FOUR TEACHING STRATEGIES ON FIFTH GRADE STUDENTS' LEARNING OF FRACTIONS ADDITION AND SUBTRACTION

by

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Abstract

There are different tools, resources, and materials that the mathematics teachers may use to enhance the teaching and learning processes under many types of teaching strategies such as technology (e.g., videos and virtual manipulatives), real objects (e.g., concrete manipulatives), and other teaching strategies are traditional (e.g., lectures). Some of the most important things that a teacher has to consider is the students' learning needs and how to reach to their minds by different teaching strategies with a variety of resources and assess which are more effective in students' learning and development in mathematics.

The purpose of this study is to investigate the effectiveness of using four teaching methods with videos, virtual manipulative, concrete manipulatives, and lectures on fifth grade students' fraction addition and subtraction learning. This study applied the methodology of a quasi-experimental pre-test and post-test same group design on a sample of 95 fifth grade students in four private schools with two different curricula chosen in Abu Dhabi, United Arab Emirates. The intervention with three teaching methods (with videos, virtual manipulatives, and concrete manipulatives) as experimental and traditional teaching method as control were applied for two weeks in the spring of 2022.

The results show that there were some differences between the students' performance in fraction addition while they learned it through video, virtual manipulative, and concrete manipulative compared to the traditional lecturing method. Among the three methods experimented, students performed better in concrete manipulative followed by videos and virtual manipulatives. Among the two curricula, UAE MOE and American, the result was in favor to the UAE MOE. Also, there was statistically significant difference between the boys' and girls' performance, with girls' performance better than the boys in learning fractions.

The findings of this study have pedagogical implications to improve the students' skills in fractions through improving the teaching strategies. Therefore, the students' achievement and attitude toward learning mathematics can be improved with the use of appropriate tools in teaching and learning.

Keywords: Teaching mathematics, learning mathematics, fraction addition, fraction subtraction, video, virtual manipulatives, concrete manipulatives, lecturing, quasi-experimental design