

Effects of Mathematical Vocabulary Instruction on Students' Achievement in Mathematics in Secondary Schools of Murang'a County, Kenya

Benson Njoroge Wanjiru

Abstract

The purpose of the study was to explore the influence of mathematical vocabulary instruction on students' Mathematics achievement. The study was guided by the following objectives: to determine the extent to which mathematical vocabulary instruction influences students' performance in Mathematics, to establish the attitudinal change towards Mathematics due to mathematical vocabulary instruction, to establish the strategies that can be used to enhance the mastery of mathematical vocabulary and to develop a prototype for a lesson plan for Mathematics vocabulary based instruction. The study was a non-equivalent control group pretest-posttest quasi-experimental design. The target population was 98,200 students from 257 secondary schools in Murang'a County. It was conducted in two purposively selected secondary schools in the County. The study sample was 216 Form Two students and 6 Mathematics teachers. Both the experimental and the control groups consisted of 54 students from each school. The experimental groups were taught mathematical vocabulary using the Graphical Organizer based on the Frayer Model with ICT integration instructional approach for 10 weeks while the control groups were taught mathematical vocabulary using the definition-only method for the same period. The study employed 7 instruments namely: Students Mathematics Attitudes Questionnaire, Pre-test Students' Mathematics Vocabulary Test, Post-test Students' Mathematics Vocabulary Test, Students' Mathematical Vocabulary Dictionary, Pre-test Students' Mathematics Achievement Test, Post-test Students Mathematics Achievement Test and Mathematics Teachers' Questionnaire to collect both qualitative and quantitative data. Data was analysed using one-way ANOVA, independent t-test and paired t-test. The statistical significance of the results were then examined at $\alpha = 0.05$ statistical confidence level. The findings indicated that: there was a positive association between mathematical vocabulary instruction and students' performance in Mathematics, there was a statistically significant difference between the students' performance in Mathematics for the group taught Mathematics vocabulary using the Frayer Model and those taught Mathematics using the definition-only method, the students' attitude towards Mathematics improved due to exposure to the Mathematics vocabulary instruction and the most effective strategy for mathematical vocabulary instruction was the use of Graphical Organizer based on the Frayer Model with ICT integration because it is learner centered. A prototype lesson for mathematical vocabulary instruction based on the Frayer model with ICT integration was developed. The study recommends the use of Frayer Model with ICT integration as an instructional strategy for Mathematics based Vocabulary instruction and a further study to investigate the effects of social language (motivation) on students' performance in Mathematics.

Keywords: Mathematical Vocabulary Instruction, Students' Achievement, Mathematics Secondary Schools, Murang'a County, Kenya

Full text: <https://ir-library.ku.ac.ke/handle/123456789/13349>