A COMPARATIVE STUDY OF JIGSAW COOPERATIVE LEARNING STRATEGY AND CONVENTIONAL TEACHING METHOD ON STUDENTS' MATHEMATICS SELF-CONCEPT AND ACHIEVEMENT IN SECONDARY SCHOOLS IN LAIKIPIA COUNTY, KENYA

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ABSTRACT

The knowledge of mathematics as a tool for use in everyday life is important for every individual and society. However, Secondary school students in Kenya have continued to perform poorly in mathematics in the Kenya Certificate of Secondary Education (KCSE) national examinations. This raises concern among all stakeholders in education due to the importance they attach to mathematics. The factors that are attributed to the students' poor performance in the subject include; gender stereotyping, lack of role models, the ineffective instructional methods used by teachers and the low mathematics self-concept. There is inadequate documented information in research conducted in Kenya on the effect of the use of Jigsaw cooperative learning strategy on students' self-concept and achievement in mathematics. This study sought to address the problem of ineffective instruction by teachers and low mathematics self-concept by finding out if the use of Jigsaw cooperative learning strategy during instruction of surds and further logarithms in mathematics to Form Three students has an effect on their mathematics self-concept and examination performance. Surds and further logarithms are topics performed poorly in the KCSE examination. The study was guided by the General Systems Theory and the Constructivist Theory. The study used a quasi-experimental research design. Solomon four non-equivalent control group design was used in the study. Two experimental groups received the Jigsaw cooperative learning strategy as treatment, while two control groups were taught using the conventional learning/teaching methods. A simple random sample of four co-educational secondary schools was selected from Laikipia County. The sample size was 4 schools out of the 67 schools with a population of about 20,800 students in Laikipia County. A Mathematics Achievement Test (MAT) and a Mathematics Self-Concept scale (MSC) for students were used to collect the required data. A total of 188 Form three secondary school students comprising 84 girls and 104 boys sat for the MAT and 183 Form three secondary school students comprising 85 girls and 98 boys filled the MSC questionnaires. Piloting of the instruments was done in a school which was not used for study in Laikipia County. The reliability coefficient of the MAT was computed to be 0.95 using KR-21 formula while that of the MSC was computed to be 0.96 using Cronbach alpha. MAT was validated by the researcher and also by education experts from the Department of Curriculum and Education Management, Laikipia University. Data were analyzed usingT-test, ANOVA and Scheffe post hoc to test the hypotheses at alpha (α) level of .05. The study revealed that students who were taught mathematics using Jigsaw Cooperative Learning Strategy had a higher mathematics self-concept than those taught using conventional teaching methods ($F(3,179) = 12.620$, $p = .000$). Moreover, gender did not affect students' mathematics self-concept when students were taught using Jigsaw Cooperative Learning Strategy ($t(81) = -1.345$, $p = .155$). In addition, students who were taught mathematics using Jigsaw Cooperative Learning Strategy performed better than those taught using conventional teaching methods ($F(3,184) = 31.367$, $p = .000$) and gender did not affect students' achievement in mathematics when students were taught using Jigsaw Cooperative Learning Strategy ($t(92) = -.835$, $p=.423$). The findings are expected to be useful to teachers in secondary schools because they will be able to identify learning strategies which will improve learners' mathematics self-concept and their achievement in the subject. Curriculum developers and education officers are likely to benefit from this study in deciding on the appropriate learning strategies for learners to improve the quality of mathematics instruction in the country and beyond. The research recommends use of Jigsaw Cooperative Learning Strategy in mathematics instruction in secondary schools in Kenya to improve and also reduce gender disparities in the mathematics achievement.