

Abstract

THE EFFECT OF USING MULTIPLE REPRESENTATIONS IN TEACHING ALGEBRA ON SEVENTH GRADE STUDENTS' ACHIEVEMENT

The study aimed at investigating the effect of using multiple representations in teaching algebra on the achievement of seventh grade students enrolled in public schools in the Directorate of Education in Ramallah and Al-Bireh, for the academic year 2010-2011.

The study sample consisted of two groups of seventh grade students from two schools, one for males and the other for females. The sample was divided randomly into two equivalent groups, experimental group and control group. The experimental group was taught the unit by using multiple representations, and the control group taught the unit using the traditional method.

The duration of the study was three weeks. For the purpose of this study, the researcher used the following tools:

1. A pre-test which included the most important concepts and skills covered by the Palestinian mathematics curricula for the fourth, fifth, and sixth grades (Reliability coefficient = 0.89).
2. A post-test which was carried out to measure students' achievement in the algebra unit for the seventh grade (Reliability coefficient = 0.87).
3. A new version of the algebra unit for the seventh grade which included multiple representations (pictures, spoken symbols, manipulative, and real situations).

The findings of the study revealed that there was no statistically significant difference between the average marks of male students in the experimental group and the average marks of male students in the control group, in the pre-test. Moreover, the findings revealed that there was no statistically significant difference between the average marks of female students in the experimental group and the average marks of female students in the control group, in the pre-test. On the other hand, the findings revealed that there was a statistically significant difference between the average student achievement in the post-test according to the variable of teaching method and in favor of multiple representations. In addition to that, the findings revealed that there was a statistically significant difference between the average student achievement in the post-test according to the sex variable and in favor of female. The findings revealed that there was no statistically significant difference between the average student achievement in the post-test depending on the interaction between the variables of sex and method of teaching.

At the end of the study, the researcher recommended the following:

1. Math curriculum should have more multiple representations.
2. Math teachers should be trained on how to use multiple representations in their teaching.
3. To study further the effects of using multiple representations in teaching fractions and geometry on students' achievement at various educational levels.