

Abstract

The Palestinian Students' Spatial Ability Level

And Trend of Development Through

Grades Seven, Nine and Eleven

By

Nuha Lutfy Yacoub

Supervising Committee

Dr. Fateen Masa'd..... Major Advisor

Dr. Maher Hashweh

Dr. Salah Yaseen

Spatial Ability is correlated in general with achievement in mathematics, particularly with geometry. This made it at the core of interest for many researchers. Thus assessing students' spatial ability and seeking methods of developing it became extremely important.

The aim of this study has, therefore, been to measure the level of spatial ability and its components: spatial perception, spatial

visualization, spatial orientation and its development trend through seventh, ninth and eleventh grades.

A stratified sample consisted of ٧٠٦ female and ٧٠٠ male students randomly selected from ٧th, ٩th and ١١th grades in three types of schools in RamAllah district: governmental schools, UNRWA schools and private schools.

Seven tests were included in this study, three of which were used to measure spatial perception level: number comparison test, identical pictures test and hidden figures test. Two tests were used to measure spatial visualization: paper folding test and surface development test. The remaining tests were used to measure spatial orientation: cube comparison test and card rotation test.

Five questions were proposed for this study:

١. What is the spatial ability level of ٧th, ٩th and ١١th graders?
٢. Are there any differences in spatial ability level, spatial perception level, spatial visualization level, spatial orientation level between ٧th, ٩th and ١١th graders attributed to class level?
٣. Are there any differences in spatial ability level, spatial perception level, and spatial visualization level, spatial orientation level between students in each of ٧th, ٩th and ١١th grades attributed to

gender?

- ٤. Are there any differences in spatial ability level, spatial perception level, and spatial visualization level, spatial orientation level between ٧th, ٩th and ١١th female graders attributed to class level?
- ٥. Are there any differences in spatial ability level, spatial perception level, spatial visualization level, and spatial orientation level between ٧th, ٩th and ١١th male graders attributed to class level?

To answer these questions sixteen hypotheses were proposed and One-way analysis of variance was used to test all the hypotheses. The findings have statistically indicated significant differences in students' spatial ability and its components levels between seventh, ninth and eleventh grades in favor of both seventh and ninth grades. Moreover, statistically significant differences in favor of females in spatial ability and its components were found in ninth grade and in favor of males in eleventh grade, however no statistically significant differences between males and females were found in seventh grade.

In addition, statistically significant differences in spatial ability and both spatial perception and spatial visualization levels were found between ninth and eleventh graders female students in favor of ninth grade , and between eleventh and seventh grade favoring seventh grade.

But the only found statistically significant differences between seventh and ninth graders female students were in spatial visualization in favor of ninth female graders. Meanwhile, no statistically significant differences between seventh, ninth and eleventh male graders in spatial ability and its components levels were found.

Based on these findings, examining the effect of including spatial ability training units in mathematics curriculum on both students' spatial ability level and mathematics achievement is highly recommended.