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EXPLORING THE RESULT OF THALES THEOREM AND ITS RELATIONSHIP TO OTHER SHAPES AMONG IRANIAN MATHEMATIC HIGH SCHOOL STUDENTS

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ABSTRACT: This paper sheds more lights on finding out a new methodology in teaching Thales theorem results and working with fractions in similarity to help students analyze Thales theorem and come up to some solutions with solving any problems related to the pieces of Cross Chords of Circle, Right Triangle and Right Trapezoid. In this regarding, I have come to a conclusion, from fourteen years of teaching experience in mathematics to Iranian high school students, that the best way could be starting from theorem statements to hypotheses as well as using properties of fractions. Therefore, in this study pre test-post test experimental design with control group was used and sample of the study was composed of 44 Iranian second graders at high school. It was concluded that meaningful differences in favor of experimental group and success in pre test-post test comparisons were obtained.

Keywords: Thales theorem results, fraction properties, similarity.

INTRODUCTION

Recently, there has been more emphasis upon teaching geometrical concepts and knowledge. The need has been increasing to establish a mathematics education in which students can relate the concepts to their own lives and to the other disciplines and which aims to have students acquire the basic skills and strategies at the high school (NCTM, 1991). One of the most important objectives of geometry education is to develop students' problem solving skills. These days in Iran most of the students have problem with Thales theorem concept especially in secondary school. In this study I will confine solving skills to just Thales theorem. In other words I am going to explore and find out how students deal with this problem and are able to find a better relationship between Thales theorem and other shapes in high school. The success of my Iranian students in geometry is going to be exploited in this paper. That is, this achievement highlights not only the academic achievements of the Iranian students but also their learning and teaching processes and methods.

Purpose of the study

In this research the aim was to examine the effect of a new teaching method supported by using geometry I book for Iranian high school student of the second grade. I have found this method useful for students especially in developing their attitudes, achievement and math intelligence.

METHOD

Design of the Experiment

In this study pre test-post test experimental design with control group was used to shed more lights on more reliable result. Therefore, this study is a quantitative one.

Sample of the Study

Research was carried out with students of second grade from two high schools in Mashhad. The participants were 44 second graders students in these schools. As you can see in table 1 the detailed information of the participants has been shown.

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- Selection and peer-review under responsibility of the Organizing Committee of the conference

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Table1. Participants Features

Variables		N
Group	1.	22
	2.	22
Age	16	
Gender	F	
TOTAL		44

Procedural Way and Data Gathering Instruments

The achievements tests as pre and post test were prepared considering the two units in the second grade for two groups of students from two different majors; mathematics and experiential science. Control and experimental groups were randomly selected in HefdahShahrivar and Professor Reza high schools in Mashhad. It is nice to add that the pre-test was used to select two homogeneous groups for this study. In the following table, you can see the reliability as well as some other statistical information regarding both pre-test and post-test for both groups.

Table 2. One-Sample Kolmogorov-Smirnov Test

		Pre-test (Science)	Post-test (Science)	Pre-test (Math)	Post-test (Math)
N		22	22	22	22
Normal Parameters	Mean	9.6818	10.8295	12.2955	16.4432
	Std. Deviation	4.50276	3.61658	5.00870	3.21634
Most Extreme Differences	Absolute	.161	.100	.102	.134
	Positive	.161	.075	.062	.134
	Negative	-.124	-.100	-.102	-.127
Kolmogorov- Smirnov Z		.757	.469	.481	.630
Asymp. Sig. (2-tailed)		.616	.980	.975	.822
a. Test distribution is Normal.					

The Cronbach’s Alpha reliability for all variables was 0.81.

RESULT and CONCLUSION

To describe the statistical information, first we refer to the students of control group (Science major). As the following table describes, the mean score for this group was 9.68 for the pre-test that was increased to 10.82 in the post-test.

Table 3. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Pre-Test	22	.00	19.50	9.6818	4.50276
Post-Test	22	3.25	17.00	10.8295	3.61658
Valid N (list wise)	22				

In addition, based on the following figure, about 59 percents of students possessed median score.

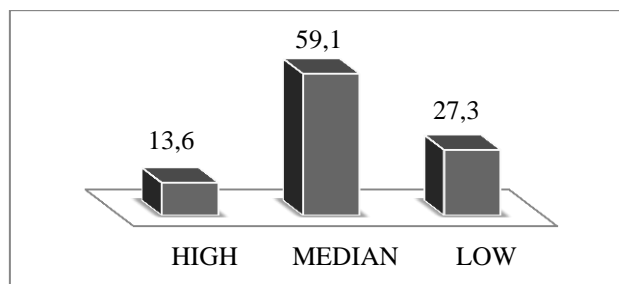


Figure1. Descriptive Statistics for Control Group (Pre-Test)

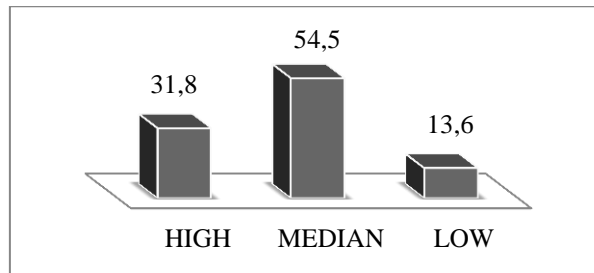


Figure2. Descriptive Statistics for Control Group (Post-Test)

After pair-t test, we could come to this conclusion that the mean score for this group was not significant

Table4. Paired Samples Test

		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	Pre-post test	-1.14773	4.34704	.92679	-3.07510	.77964	-1.238	21	.229

Now, about the experimental group (Math major) the statistical information was elaborated in the following table.

Table5. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Pre-test	22	.00	20.00	12.2955	5.00870
Post-test	22	10.00	20.00	16.4432	3.21634
Valid N (list wise)	22				

The mean score for pre-test was 12.29 increased to 16.44 after taking the post-test.

Moreover, based on the figure came below, 54.5 percents of the students owned median score and 36.4 percents possessed high score.

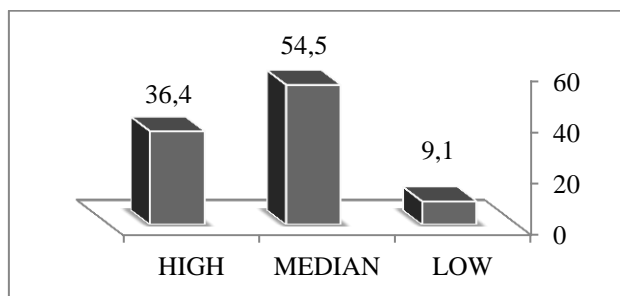


Figure3. Descriptive Statistics (Pre-Test)

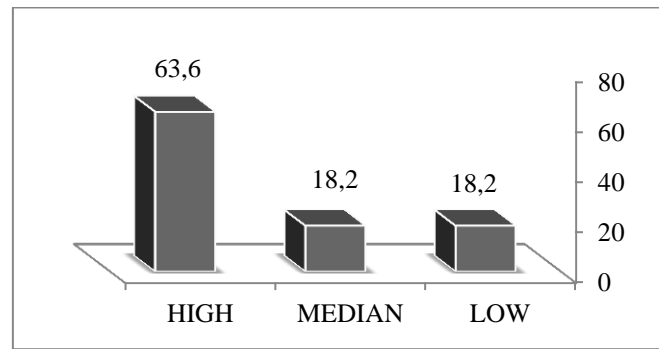


Figure4. Descriptive Statistics (Post-Test)

After pair-t test, we could come to this conclusion that the mean score for this group was significant. P-value=0.02

Comparison of the Two Groups

Table6. Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
VAR00001	.760	.388	-1.820	42	.076	-2.61364	1.43594	-5.51147	.28420
			-1.820	41.533	.076	-2.61364	1.43594	-5.51244	.28516

Comparing these two groups together (control and experimental groups) lead us to this conclusion that for pre-test the difference was not significant. However, after post-test the mean scores of the students of the experimental group were considerably increased.

Table7.Pre-Test

VAR00002	N	Mean	Std. Deviation	Std. Error Mean
VAR00001 Science	22	9.6818	4.50276	.95999
Math	22	12.2955	5.00870	1.06786

Table8. Post-Test

VAR00002	N	Mean	Std. Deviation	Std. Error Mean
Science	22	10.8295	3.61658	.77106
Math	22	16.4432	3.21634	.68573

In sum, I found this new method useful for the high school students and highly recommended to the teachers.

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