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The Comparison of Students' Math Performance Based On Pre-School Courses

Fatemeh Ghasemipour*, Davood Afkhamitaba, Mohammad Noor Rahmani

Department of Mathematics Education, Bandar Abbas Branch, Islamic Azad University, Bandar Abbas, Iran.

A B S T R A C T

This study compared the math performance of students in primary schools on the basis of preschool courses in District 1 of Bandar Abbas city. The statistical population of the study consisted of all first grade students in District 1 of education area of Bandar Abbas city. The sample volume size was determined through Cochran's formula. In accordance with the calculation formula, the sample size was equal to 117 subjects who were selected using purposive sampling and proportionate manner. Accordingly, to gather data, 2 math tests numbered as 1 and 2 are taken; test 1 includes the subjects taught at preschool course that are repeated at the first grade and test 2 includes the subjects that are taught at the first grade and are not taught at preschool course as the post test. After extracting data for analysis, descriptive and inferential statistics were used. The results show that those students who have passes the preschool courses have better performance in math compared to those peers who have not passed the preschool course.

Keywords: Math, Learning, Performance, Preschool.

INTRODUCTION

nowadays, the importance and the necessity of education in the early stages of childhood is so considerable and important the reflex of which is obvious in all scientific debates and researches and curricula of educational centers and it can be said that the most research activities are centered around this question that:

Whether primary education programs will lead to future educational successes and promotions? Childhood is one of the most important stages of human development so that research shows that two-thirds of the intelligence growth of children is up to the age of six, before the start of formal education¹. Due to the importance of this period as well as the important role of mathematics in nourishing the cognitive development of children and the thinking and reasoning ability of human beings, the need to teach mathematics to preschool children and its effect on the first grade of school is necessary².

Early Childhood is a great time for the development of children's mathematical concepts and skills. Mathematics, as a powerful tool for developing children's cognitive development in this period, can be efficient and productive^{1, 2}. Attention and investment in this critical period in order

*. Corresponding Author: Ghasemipour, F.

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to teach children and especially teaching mathematics as the most important and original domains of human thought can be effective in the future achievement of children. Mathematics is one of the valuable achievements of human civilization that today is concerned as one of the fundamental bases of industrial and technological growth³.

Currently, this science is the main nourishing force of industry and technology of space and is the main input of computer technology. Moreover, computer technology owes mathematics in all stages. In many countries, they have understood in frequent evaluation of educational systems that economic growth and development have inseparable bonds with mathematics and science (as the language of technology). In addition, mathematical science is inherently attractive according to its creative and logical nature. Numbers, lines, angles, shapes, dimensions and so on which make up the mathematical world, made the man able to see the world as meaningful. The world might have seemed confusing frustratingly in the absence of mathematics⁴. Due to the objectives of the research, the aim was first to investigate the teaching of mathematics to preschool children and its effects on the first grade of elementary school and then to try in order to promote mathematics.

METHODOLOGY

In this study, the casual-post event method was used. When researchers choose causal or post event method that there is a dependent variable and the research is for the emergence on the cause or causes of the accident or event. Accordingly, in this research first the data of the mathematics performance of the students who have passed preschool courses and those who have not passed the preschool courses were gathered and after the data classification, the data were analyzed.

The statistical population of the study consisted of all first grade students in District 1 of education area of Bandar Abbas city. The sample size was equal to 117 subjects who were selected using purposive sampling and proportionate manner according to social and educational conditions.

Collecting data in this study were in a field method. The first-grade students were referred to collect data and the required data were collected through the following questionnaires (as tools to collect information):

1. Math test 1: this test includes topics that are taught to children in preschool courses and are repeated in the first grade of elementary school and the validity and reliability of test 1 is been proved according to the point of view of mathematic teachers and experts and the reliability of this test is 0.74 which is an acceptable point. This test has 20 scores.

2. Math test 2: This test includes topics which are taught in the first grade of primary school, but are not taught in preschool stage. Validity and reliability of the test is proven according to math experts and teachers. And reliability of the test is 0.85, which is also an acceptable credit. Descriptive and inferential statistics of t test for independent groups were used for the comparison of the two populations in order to analyze the collected data through questionnaire. The SPSS software was also used.

RESULTS

The descriptive findings related to mathematics performance (test 1 and 2 results) of students are shown in Table 1 and 2. This information includes the average of mathematics performance in general and male and female separately.

Table 1. Mean and standard deviation of Math performance in the entire sample

Math performance	Number	Mean	Standard deviation
Test 1	117	14.67	1.986
Test 2	117	14.7	2.088

The descriptive findings related to mathematics performance of students of the entire sample of students show that the average of scores in test 1 related to the subjects in preschool courses is equal to 14.67 and the average of the total research sample in test 2 related to subjects of the first grade is equal to 14.7.

Table 2. Mean and standard deviation of math performance in the sample according to gender

Variable	Gender	Mean	Standard deviation
Math performance 1	Male	14.83	1.948
	Female	14.54	2.023
Math performance 2	Male	15	2.075
	Female	14.46	2.085

Students' math performance results according to gender in accordance with Table 2-4 of the study showed that the mean scores of test 1 of boys is 14.83 and the average of girls is equal to 14.54. Also, the mean score of test 2 in boys is 15 and in girls is equal to 14.46. Since two sample questions were used to compare the mathematics performance of students, the t test for independent groups was implemented for comparing the academic performance in both sample questions.

Table 3. Results of t test for independent groups to compare the performance of math (Test 1) of students who have passed the pre-school with students who have not passed the course

Group	Number	Mean	Standard deviation	t	P
Those who have not passed preschool course	52	13.92	1.666	-3.879	0.0001
Those who have passed preschool course	65	15.27	2.027		

Results in Table 3 on the mathematics performance in test 1 (issues related to preschool) shows a significant difference between students who have not passed the pre-school with students who have passed preschool given that $p=0.0001$ and is less than 0.05. According to the state of averages, the difference shows that students who have passed the pre-school did better in this test.

Table 4. Results of t test for independent groups to compare the performance of mathematics (test 2) of students who have passed the pre-school with students who have not passed the course

Group	Number	Mean	Standard deviation	t	P
Those who have not passed preschool course	52	14.26	2.393	-1.998	0.04
Those who have passed preschool course	65	15.06	1.748		

Results in Table 4 on the mathematics performance in test 2 (issues related to primary school) shows a significant difference between students who have not passed the pre-school with students who have passed preschool given that $p=0.04$ and is less than 0.05. According to the state of averages, the difference shows that students who have passed the pre-school did better in this test.

Math performances of female students who have passed the pre-school course with those female students who have not passed preschool were compared based on the t test for the independent groups. Math performance in this hypothesis was also examined in two tests of 1 and 2 and the results are given below.

Table 5. Results of t test for independent groups to compare the performance of math (Test 1) of female students who have passed the pre-school with female students who have not passed the course

Group	Number	Mean	Standard deviation	t	P
Those who have not passed preschool course	29	14.27	1.709	-0.975	0.3
Those who have passed preschool course	35	14.77	2.250		

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Results in Table 5 on the mathematics performance in test 1 (issues related to preschool) shows no significant difference between the female students who have not passed the pre-school with female students who have passed preschool given that $p=0.3$ and is greater than 0.05.

Table 6. Results of t test for independent groups to compare the performance of math (Test 2) of female students who have passed the pre-school with female students who have not passed the course

Group	Number	Mean	Standard deviation	t	P
Those who have not passed preschool course	29	14.03	2.499	-1.474	0.1
Those who have passed preschool course	35	14.82	1.617		

Results in Table 6 on the mathematics performance in test 2 (issues related to primary school) shows no significant difference between the female students who have not passed the pre-school with female students who have passed preschool given that $p=0.1$ and is greater than 0.05.

Math performances of male students who have passed the pre-school course with those male students who have not passed preschool were compared based on the t test for the independent groups. Math performance in this hypothesis was also examined in two tests of 1 and 2 and the results are given below.

Table 7. Results of t test for independent groups to compare the performance of math (Test 1) of male students who have passed the pre-school with male students who have not passed the course

Group	Number	Mean	Standard deviation	t	P
Those who have not passed preschool course	23	13.47	1.533	-5.545	0.0001
Those who have passed preschool course	30	15.86	1.569		

Results in Table 7 on the mathematics performance in test 1 (issues related to preschool) shows a significant difference between the male students who have not passed the pre-school with male students who have passed preschool given that $p=0.0001$ and is less than 0.05. According to the averages, male students who have passed the pre-school did better in this test.

Table 8. Results of t test for independent groups to compare the performance of math (Test 2) of male students who have passed the pre-school with male students who have not passed the course

Group	Number	Mean	Standard deviation	t	P
Those who have not passed preschool course	23	14.56	2.272	-1.346	0.1
Those who have passed preschool course	30	15.33	1.881		

Results in Table 8 on the mathematics performance in test 2 (issues related to primary school) shows no significant difference between the male students who have not passed the pre-school with male students who have passed preschool given that $p=0.1$ and is greater than 0.05.

CONCLUSION

The aim of this study was to compare the performance of students in mathematics based on pre-school courses. Firstly, the math performances of students who have passed the pre-school with students who have not passed the course were investigated. Results of t test for independent groups in this case show that there is significant difference between the students who have passed this course with those students who have not passed the course in the certainty level of 95%. The results specifically related to the Math performance of students show that the difference is more related to the parts that are taught in the preschool stage than to those parts taught in the first grade. Studies also showed that although students who have passed preschool course have been involved in math exercises more and earlier, the mathematic development occurs at the end of the first grade of primary school and there are consistencies in this study on the basis that the level of difference of the issues related to preschool are less than the issues related to the first grade^{1, 3}.

Students who pass the pre-school stage solve math problems better and faster. So, preschools can affect the improvement of mathematics achievement of students in the first grade.

Then, the math performance differences between the female students who pass the pre-school with those female students who do not pass the course were examined. Results of t test for independent groups for the comparison of the two groups showed that there is no significant difference between the math performances of the female students who pass the pre-school with those female students who do not pass the course. Since the girls have more relationship with their mothers and currently in many families. Mothers are the co-players of their daughters, they are taught different subject matters and this eliminates most of their educational lacks. Observations have shown that families teach primary subjects of mathematics like counting even before the preschool age and since girls spend most of their time with their parents, they have no difference in the math performance in the preschool age and the first grade of primary school.

Finally, differences in math performance of male students on the basis of passing pre-school were evaluated. Results of t test for independent groups for the comparison of the two groups showed that there is a significant difference between the math performances of the male students who pass the pre-school with those male students who do not pass the course in the issues related to preschool in the certainty level of 99%. But there is no significant difference between the two groups about topics related to first-grade mathematics. If boys do not pass the preschool stage, they are less introduced to educational subjects due to the fact that they are more likely to play and have more peers for their play compared to girls and show less tendency towards educational issues. By entering the school and adequate intelligence quotient in understanding subject matters, boys will soon reach normal status in math performance issues.

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