

THE RELATIONSHIP BETWEEN ELEMENTARY STUDENTS' ATTITUDES TOWARDS MATHEMATICS AND STUDYING TO MATHEMATICS

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ABSTRACT

In this research it was carried out to examine the relationship between elementary students' attitudes towards mathematics and studying to mathematics lesson. For this purpose, the relationship between elementary students' attitudes towards mathematics and studying to mathematics lesson of 500 primary school students in Istanbul is investigated. It is investigated whether there is a relationship between mathematics attitude and students' gender, and if there is someone that help to study lesson at home, and whether they have their own room and computer, and for what purpose the computer is used, and their family's economic level, and the duration of regular lesson study, and the duration of daily mathematics lesson study. To provide the data that is required for the purpose of the study; questionnaire containing demographic characteristics and "Mathematics Attitude Scale" that is developed by Baykul (1990), were used to collect data. It has been seen that there is significant differences, among students using the computer to prepare homeworks and all other students on behalf of using the computer to prepare homeworks. It was found a significant differences in mathematics attitude on behalf of the students who study regular every day lesson; by comparison of students those study regular lesson every day and the students those don't study regular every day. Significant differences were found between the students who study lesson more than 2 hours a day and all other students, on behalf of the students who study lesson more than 2 hours a day. Also significant differences were found between Also a significant differences were found between children of 800-2000 TL-income families and children from other families, on behalf of children of 800-2000 TL-income families.

Keywords: Primary education, mathematics, mathematics attitude, study the lesson.

INTRODUCTION

As known, the basic feature that separates human from other creatures is; thinking, ability of the evaluating the events and reorganisation conditions suitable to himself. The tool of developing of this skill and turning into action is verbal and numerical language. In this context, the Mathematics, one of the most important tools that develops thinking. Therefore mathematics education builds one of the important blocks of basic education or perhaps creates the most important one (Umay, 2003). Mathematics, as in science also as well as one of the important tools used to solve the problems of daily life. The expression of word "problem" includes not only

the numerical problems, in general, the word "challenge" so-called problems. Because of its importance, mathematics related behaviors is located in every area and at all levels; in elementary curriculum, even from pre-school education curriculum to higher education curriculum (Baykul, 2001). Obtained achievements related to mathematics of the individual depends on many factors. These factors are effective in acquiring skills related to mathematics (Altun, 1994). These are some of the factors that may affect the success in mathematics of individual, in positive or negative way: the individual's age, developmental level, interests and needs, level of intelligence, health, living environment, the teacher factor, the school starting age and attitudes towards mathematics (Şahin, 2000).

In this study; it is tried to examine the effect of attitude on studying mathematics lesson, from the above mentioned factors. Attitude is a complex mental state involving beliefs and feelings and values and dispositions to act in certain way of individual's choice (Senemoğlu, 2001). Attitude according to Thorsten is the density of negative or positive feelings towards a psychological object. This psychological object can be a symbol person, expression and slogan or idea. According to Wagner, conceptually, attitude refers to affective, cognitive, and behavioral components that correspond, respectively, to one's evaluations of, knowledge of, and predisposition to act toward the object of the attitude (Gable 1986; Trans. Tekindal 2009). Attitudes have a great role in being successful or unsuccessful in mathematic lesson, to love mathematics (Çoban,1989; Trans. Taşdemir, 2009) and related to this issue to study mathematic lesson. Many researchs indicate that students' attitudes towards mathematics influence mathematics achievement (Minato and Yanase, 1984; Ethington and Wolfe, 1986; Cheung,1988; Ma, 1999; Baykul, 1990; Yenilmez and Özabacı, 2003; Tapia and Marsh, 2000; Peker and Mirasyedioğlu, 2003).

Successful students defined as "students that recognize their own properties and in this context, use effectively variety methods of studying and learning" (Yıldırım et al., 2000). Learning and academic success of students are associated with use of studying time effective and efficient (Arsal, 2007). Students' study habits are the habits that they developed from mostly their own private life, their own methods, within their own value system (Yılmaz, 1987; Trans.Özbey, 2007). The people who lives at the environment of individual, has also a significant impact on formation of mathematics attitude (Beswick, 2006). Among these, there are individual's teachers, family and friends (Yücel and Koç, 2011).

We can observe usually in the literature, studies to determine the relationships between mathematics attitudes and work of students with the achievement. However it is obviously significant that situation of studying lesson and attitude to the lesson influence the success of the students. In this context, the relationship between mathematics attitudes and mathematics study is necessary to study and this research was designed considering to contribute to the literature.

PURPOSE

In this research it was carried out to examine the relationship between elementary students' attitudes towards mathematics and studying to mathematics lesson. For this purpose; it is investigated whether there is a relationship between mathematics attitude and students' gender, and if there is someone that help to study lesson at home, and whether they have their own room and computer, and for what purpose the computer is used, and their family's economic level, and the duration of regular lesson study, and the duration of daily mathematics lesson study.

METHOD

In this research, survey (descriptive-survey) model was used. Survey model aims to describe the existing situation as it stands in the past or currently (Karasar, 2005).

Universe And Sample

The universe of the study consists of primary schools in Bakırköy district of İstanbul province. The sample of the study consists of primary schools students in the district of Bakırköy, studying in classes 4, 5 and 6, who are composed of 500 students selected randomly. 261 (52.2%) females and 239 (47.8%) male students are forming the sample of study.

Data Collection Tools

To measure students' attitudes towards mathematics, "Mathematics Attitude Scale" that is developed by Baykul (1990) were used to collect data. Mathematics Attitude Scale is 5-Likert-type scale consisting of 30 items. Validity and reliability of the scale has been done and cronbach alpha coefficient has been determined as 0.96 (Baykul, 1990). With this scale, in order to determine the demographic characteristics of students, a demographic characteristics questionnaire was used. This questionnaire was prepared by researchers and consists of questions about grade level, mathematics achievement, family economic status, the status of computer use and the duration of mathematics lesson and lesson study.

Data Analysis

For the general purpose of this research necessary statistical solutions for data collected with the attitude scale, were analyzed using the software package SPSS13.0 (Büyükoztürk, 2003). The level of significance of these statistics was taken as 0.05. To analyse data; t test, analysis of variance (ANOVA) and in cases of analysis of variance significant the LSD technique were used.

RESULTS AND CONCLUSIONS

After analysis of collected data, the findings are presented under the headings of the table according to the order of purpose.

Table 1. Unrelated Group t Test Results, Done to Determine, Whether Mathematics Attitude Scores of Students Differ According to The Gender Variable

Point	Groups	N	Average	SS	Sh _x	t Test		
						t	Sd	p
Gender	Female	261	111,7625	25,37665	1,57077	,066	498	,947
	Male	239	111,6151	24,06387	1,55656			

If we look at results of independent group t test in Table 1; done to determine whether mathematics attitude scores of students differ according to the gender variable, we can see the arithmetic average of the difference between the groups was not statistically significant.

Table 2. Unrelated Group t Test Results, Done to Determine, Whether Mathematics Attitude Scores of Students Differ According to Getting Help to Study Lesson at Home Variable

Point	Groups	N	Average	SS	Sh _{x̄}	t Test		
						t	Sd	p
Getting Help to Study Lesson at Home	Yes	378	111,1587	24,57881	1,26420	-,848	498	,397
	No	122	113,3443	25,23633	2,28479			

If we look at results of independent group t test in Table 2; done to determine whether mathematics attitude scores of students differ according to getting help to study lesson at home variable, we can see the arithmetic average of the difference between the groups was not statistically significant. For this variable of the research, it was expected high positive attitudes for the students that get help. However, as shown to get or not get help does not seem very effective. In this case, independent from getting help, it can be considered the students' study habits are more important.

Table 3. Unrelated Group t Test Results, Done to Determine, Whether Mathematics Attitude Scores of Students Differ According to Ownership of Study Room Variable

Point	Groups	N	Average	SS	Sh _{x̄}	t Test		
						t	Sd	p
Ownership of Study Room	Yes	417	112,4508	25,11929	1,23010	1,540	498	,124
	No	83	107,8795	22,44799	2,46399			

If we look at results of independent group t test in Table 3; done to determine whether mathematics attitude scores of students differ according to ownership of study room variable, we can see the arithmetic average of the difference between the groups was not statistically significant. It can be expected that a separate study room will help to be more successful and depending on this issue the attitude will be higher in positive sense. However, it can't be reached the data that support this issue in this research, although at this age not having a separate room in the house; organization properly any place of the house to study lesson or use of the room with the the siblings would not effect attitude.

Table 4. Unrelated Group t Test Results, Done to Determine, Whether Mathematics Attitude Scores of Students Differ According to Ownership of Computer Variable

Point	Groups	N	Average	SS	Sh _{x̄}	t Test		
						t	Sd	p
Ownership of Computer	Yes	441	111,0998	24,99989	1,19047	-1,465	498	,143
	No	59	116,1186	22,33992	2,90841			

If we look at results of independent group t test in Table 4; done to determine whether mathematics attitude scores of students differ according to ownership of computer variable, we can see the arithmetic average of the difference between the groups was not statistically significant. The sample group of students who do not have a computer at home is a tiny amount in the state; looking at this situation, we can say the prevalence of computer usage increases and computer ownership is not anymore a privilege. It is natural condition that the usage of a tool which is not anymore a privilege, does not create differences. In this research although it was aimed to test this variable, significantly increased prevalence was not taken into account. Although the

research does not aim to measure the rate of computer use, but having an acquired idea with this research on this issue may show the way for future researches.

Table 5. One-Way Analysis of Variance (ANOVA) Results, Done to Determine, Whether Mathematics Attitude Scores of Students Differ According to Purpose of Computer Usage Variable

Point	Group	N, SS and X Values			ANNOVA RESULTS					
		N	X	SS	Var. K.	K.T.	Sd	K.O.	F	p
Purpose of Computer Usage	homework preparation	142	110,90	23,67	Among-Group	7397,463	3	2465,82	4,106	0,007
	Lesson Study	119	117,51	22,50	Inter-Group	297857,105	496	600,518		
	Game	110	106,23	24,82	Total	305254,568	499			
	multi-purposeful use	129	111,84	26,79						
	Total	500	111,69	24,73						

If we look at results one-way analysis of variance (ANOVA) results, done to determine, whether mathematics attitude scores of students differ according to purpose of computer usage variable: difference between the purpose of the computer usage variable and the arithmetic average of the groups is found statistically significant. After this (ANOVA), complementary post-hoc analysis techniques were applied to determine due to which group significant differences are based on. After the the one-way analysis of variance (ANOVA) results, carried out to determine mathematics attitude scores according to the variable of the purpose of the computer use differ between which sub-groups, we have seen that as a result of post-hoc LSD test scores among students who use the computer for homework preparation was significantly higher than all other students. There was no statistically significant difference between the other sub-dimensions.

Review of the research in this area did not give the expected result. It was expected not to have a significant relationship between mathematics attitude and different purposes of using the computer or playing games by computer. However, attitudes may be low by the students who use the computer with the aim of studying mathematics due to property of mathematic lesson. Because studying mathematic lesson occur as problem solving and the students prefer to use books by problem solving. It affects their attitude. However, preparing homework by utilizing technology it is possible to support the homework with cleaner writing and more regular shapes. With high positive attitude towards mathematics lesson students want to do their homework diligently and computer support in this situation is a natural condition.

Table 6. One-Way Analysis of Variance (ANOVA) Results, Done to Determine, Whether Mathematics Attitude Scores of Students Differ According to Average Income Of The Family Variable

Point	Group	N, SS and X Values			ANNOVA RESULTS					
		N	X	SS	Var. K.	K.T.	Sd	K.O.	F	p
Average Income of the Family	More than 800 ytl	72	105,44	22,57	Among-Group	4376,716	2	2188,35	3,615	0,028
	800-2000 ytl	248	114,10	24,39	Inter-Group	300877,852	497	605,38		
	More than 2000 ytl	180	110,86	25,64	Total	305254,568	499			
	Total	500	111,69	24,73						

If we look at results one-way analysis of variance (ANOVA) results, done to determine, whether mathematics attitude scores of students differ according to average income of the family variable: the difference between the arithmetic mean of groups with an average income of the family is found statistically significant. After this (ANOVA), complementary post-hoc LSD test analysis techniques were applied to determine due to which group significant differences are based on. Scores of students, with family income 800-2000 YTL, was significantly higher than all other students. There was no statistically significant difference between the other sub-dimensions.

This finding of the research is expected. Sociological point of view, education is also an tool for vertical mobility. Generally, the middle class's motivation is much higher to benefit from these vehicles. Because the human beings want to rise up from the curent position to the higher position and middle classes are positionally closer to the next level. Students coming from the lower level families see themselves away from the target to rise up to the next level. The students at top-level are already at the top and may not care much for the power of education. The students of the middle class families by 800-2000 YTL income have higher mathematics attitude scores and it supports findings in this situation.

Table 7. Unrelated Group t Test Results, Done to Determine, Whether Mathematics Attitude Scores of Students Differ According to Every Day Regular Mathematics Lesson Study

Point	Groups	N	Average	SS	Sh _{x̄}	t test		
						t	Sd	p
Every Day Regular Mathematics Lesson Study	Yes	375	115,9520	23,49110	1,21308	6,983	498	,000
	No	125	98,9120	24,03761	2,14999			

If we look at results of independent group t test in Table 7; done to determine whether mathematics attitude scores of students differ according to every day regular mathematics lesson study variable, we can see the arithmetic average of the difference between the groups was statistically significant. The average of mathematics attitude scores of the students that study every day regular mathematic lesson were significantly higher than the students that does not study every day regular mathematic lesson. This finding of the research is expected. If we consider the sequence of the subject, it is expected that the attitudes of students will be higher who use the time correct and dissipate lacks in time.

Table 8. One-Way Analysis of Variance (ANOVA) Results, Done to Determine, Whether Mathematics Attitude Scores of Students Differ According to Daily Mathematics Lesson Study Time Variable

Point	Group	N, SS and X Values			ANNOVA RESULTS					
		N	X	SS	Var. K.	K.T.	Sd	K.O.	F	p
Daily Mathematics Lesson Study Time	Less than half an hour	146	102,42	25,08	Among -Group	21379,623	3	7126,54	12,452	0,000
	1 hour	236	115,18	22,80	Inter -Group	283874,945	496	572,329		
	2 hours	77	112,14	25,75	Total	305254,568	499			
	More than 2 hours	41	123,73	22,36						
	Total	500	111,69	24,73						

If we look at results one-way analysis of variance (ANOVA) results, done to determine, whether mathematics attitude scores of students differ according to daily mathematics lesson study time variable: difference between the daily mathematics lesson study time with the arithmetic mean of groups was found statistically significant. After this (ANOVA), complementary post-hoc analysis techniques were applied to determine due to

which group significant differences are based on. As a result of LSD test, scores of students who are working more than 2 hours homework, were significantly higher than all other students. There was no statistically significant difference between the other sub-dimensions. This finding of the study provides information about the time needed by the students for studying mathematics lesson. This means that using the time correctly can be considered to be more effective than very less study or much study than needed.

CONCLUSION AND DISCUSSION

As a result of this research, it is seen that there is not a relationship between mathematics attitude and students' gender, if there is someone that help to study lesson at home, whether they have their own room and computer. It has been seen that there is significant differences, among students using the computer to prepare homeworks and all other students on behalf of using the computer to prepare homeworks. It was found a significant differences in mathematics attitude on behalf of the students who study regulary every day lesson; by comparison of students those study regulary lesson every day and the students those don't study regulary every day. Significant differences were found between the students who study lesson more than 2 hours a day and all other students, on behalf of the students who study lesson more than 2 hours a day. Also significant differences were found between. Also a significant differences were found between children of 800-2000 TL-income families and children from other families, on behalf of children of 800-2000 TL-income families.

In many studies it has been revealed that gender difference does not have any impact on the mathematics attitude. (Çelik and Bindak, 2005; Ursini and Sanchez, 2008; Yücel and Koç, 2011; Yılmaz, 2006). There is also studies which emphasize the effect of gender on attitudes and change of mathematics attitudes of male and female students' (Tapia and Marsh, 2000; Yenilmez and Özabacı, 2003). So the studies examining the relationship between attitudes and gender disclosed not a exact result. As a result of this finding, the factors that build up mathematics attitude can be said to have the same impact on male and female students. Yucel and Koç (2011) stated; mathematic lesson is a basic course that all students face in their learning lives, has a significant weight in determining success in most exams and towards mathematics for all students irrespective of gender shows that a similar approach.

With the introduction of technology in education environments, computers started to use in math class effectively. Studies show us that the use of technology effectively in mathematics lessons helps to improve the motivation and self-confidence of students (Tapia and Marsh, 2000). The current studies show that technology-supported mathematics teaching having a positive effect on attitude (Pierce, Stacey and Barkatsas, 2007). In this respect, in the study, students using the computer to prepare homework can turn abstract concepts in mathematics into concrete concepts by using the computer visualization features. According to research finding, there is a significant difference between the students using the computer for the purpose of preparing homework and the other students, but no significant difference was found between the presence or absence of a computer at home. It is expected, emergence of these two comparisons, to support each other. However, it is not seen a difference in attitude between students who have computer at home and who does not have a computer at home. The reason for this is; having not a computer at home does not carry the meaning that students can not reach a computer. Because, today the use of computers is quite widespread; at school and outside school students have the opportunity of easily access to computer. If we look in sample group, the ratio of the students who does not have a computer at home is very low. As can be seen in Table 4, 441 students have a computer at home, only 59 students does not have a computer at home. In this case, it can be said that the students have the opportunity of access to the computer outside the home and use technological possibilities in preparing homework as needed.

Another finding of this research is; the family's socio-economic level effects to develop students' attitudes toward mathematics lesson. The results of the research made by Yılmaz (2006) and Çoban (1989) (Trans. Yılmaz, 2006) seem to support this finding. Researchs shows us that the attitudes towards mathematics lesson

of students with high-and middle-level of socio-economic status more positive than students with low socio-economic status. In addition, the research of Yenilmez and Duman (2008) and Şengönül (1995) achieved the results that school achievement levels of students coming from middle or high income families are higher than students coming from low income level. In this context, the family's income level affects the student's mathematics attitude, also play an important role in the mathematics success. Mathematics learning is composed of consecutive issues. It may be too difficult to learn higher-digits of issues for the child who can not learn a lower-digits of any issues. This strain can cause to develop negative attitudes towards mathematics. However, families with middle-and high-level income interest more closely with the education of their children and may help to overcome the lack learning aid in time. Students who overcome the lack in time, fully comprehend the previous issues, are more likely to work fondly. In this case they develop positive attitudes towards mathematics.

In addition, according to the findings of this research, family socio-economic status is associated with mathematics attitude but the student's who own a study room at home and who get help to study lesson at home was not a statistically significant difference between mathematics attitude. As mentioned above, it is important to help in time to overcome the lack in case when the lack is realized. On time helps will lead to win self-study habits and at the same time increase the student's self confidence. Students, who can not study by himself and constantly in need of an assistant, can not be successful real terms. Also to have a own room might not be much important for the students who assumed the habit of self-study.

An important finding of this study, which was carried out to examine the relationship between elementary students' attitudes towards mathematics and studying to mathematics lesson, is there is a significant differences between the students who study lesson more than 2 hours a day and all other students, on behalf of the students who study lesson more than 2 hours a day. It has not been encountered a research with this finding done by similar sampling. This finding of the research, the issue of studying mathematics associated with the mathematics attitude can not be ignored, is considered original and a problem to be investigated. However, it was found out in the research made by Aرسال (2007) that students who are successful in mathematics lesson use more often time management strategies and unsuccessful students do not use these strategies in sufficient level. As expressed by Aرسال (2007), it may be considered that students who are successful in mathematics lesson plan studying time, study regularly each day and use of time more efficient in terms of learning.

RECOMMENDATIONS

According to the research results the following recommendations can be made:

Recommendations for those who work in this field;

- In the future researchs, factors determining mathematics attitude of primary school students can be investigated with a larger sample groups.
- Research including the opinion of students towards computer usage in mathematics attitudes and mathematics learning can be done.
- The relationship between the mathematics attitude, socio-economic levels and individual's studying environment should be investigated.
- Extensive research can be done examining the impact of computer usage forms on mathematics achievement and attitude.
- Extensive research can be done examining the relationship between studying lesson and mathematics and mathematics achievement and attitude.

Recommendations for practitioners in the field and families;

- Teachers and parents should consider that the need to remedy deficiencies in a time, develop positive attitudes towards mathematics.

- They must be conscious by using the technology and the computer and students should be guided in this direction.
- Teachers should guide the students to set out their own creativity and productivity.
- Working with different materials help students to concretize the subject more easily. Taking this into account; teachers should facilitate the achievement of the necessary materials and encouraged students to work with these materials.
- Students should be helped effectively to develop the right studying habits.
- It would be advisable for teachers and guidance teachers who make time planning with students to consider the finding that students need to study mathematics lesson at least two hours daily.

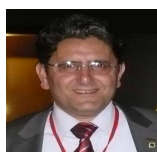
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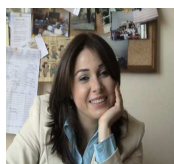
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