



Examination of attitudes of secondary school 6th classtudents related to their attitudes towards maths in the frame of several variables¹

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Abstract

This research, which is carried out in Kinik, İzmir, aims at determining the reasons of students' attitude towards Maths. Sixth class students from Kinik town make up population of the research which has been carried out as the model of survey. The sample of the research has been determined by the method of "purposeful sampling". It is constituted of 152 students at the sixth grade. Collected data has been transferred into SPSS and the statistical process such as, analysis of average, standard deviation, T-test and one way analysis of variance procedures have been realized. It has been identified that the students who gets higher grades at Maths have got better attitude towards Maths than the ones who got lower grades at Maths. It has been identified that there has been no relationship between the students' attitude towards Maths and their families' income, their parents' educational status, their parents' occupation and the teachers' way of teaching.

Keywords: Maths; Attitude Towards Maths; Secondary School; Sixth Class.

1. Introduction

Mathematics is an aim at revealing, orienting people's skills, gaining a systematic and logical thinking habit and is a device which is used in all activities of human beings. As Mathematics contributed to human being in every context, it is very important for it to be taught and used by people. Mathematics has an important role in the progress of societies at a contemporary direction and reaching a requested developmental level (Bulut, 1988).

Mathematics, as a thinking moreover a living style, is an essential field for individual, society, scientific researches and technological developments in every field of daily life. Learning of Mathematics is an obligation as a field which develops upper level attainments such as analyzing, reasoning, communicating, generalizing, and thinking as creative and free. Because none of the individuals or institutions in our daily lives cannot study effectively and efficiently without having a mutual relationship with different individuals and arrangements (Aksu 1991).

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As Mathematics course has been based on pre-learning, mathematical situation of the child at elementary school is important. Because pre-learning affects the later learning. Because of this reason, it is required to examine Mathematics curriculum of elementary and secondary education. According to Altun(1998), elementary education curriculum aims at acquiring every kind of knowledge and skill which the life requires. In addition to this, in case of students continuing their education, acquiring basic Mathematics knowledge and skill which is required for their education has been aimed at.

Mathematics is thought to be a difficult course in Turkey. Many factors have been effective in the formation of this perception. If we ask anyone we met on a street with any education level, he can tell that Mathematics is a difficult course. At the same time, the course which the students at a school most abstain from and afraid of has been Mathematics (Tektas, 2009). The effect of positive and negative attitudes which have been realized at elementary education years of the students plays an important role in the formation of this fright, but not because of Mathematics being a difficult course. Several factors can be effective in the formation of these attitudes.

Neale (1969) defines the attitude towards mathematics as like or dislike Mathematics, inclination of being interested or getting away from Mathematical activities, the belief that the individual will be bad or good at mathematics and the belief whether Mathematics will be beneficial or unbeneficial. The students' attitudes towards Mathematics which exist related to their feelings about mathematics are very important in Mathematics education. Mental and emotional processes are undeniable pieces of learning and there is a mutual relationship between these. Feelings and expectations effect what are being learned. The findings of several researches about brain point out those feelings have been very important in learning(Caine and Caine, 1991; Lackney, 2000). Feelings about a subject can change in the learning process. The feelings exist by the help of attitude. Although the students forget their knowledge about any subject, they do not forget their attitude on inclinations on this subject (Stodolsky, Salk and Glaessnes, 1991). While many teachers take knowledge and cognitive objectives as a basis in their courses, they ignore attitude as a dynamic factor and emotional features while reaching these objectives (Ulgen, 1997). However, in addition to cognitive features of students, affective field at recent times has been accepted as a piece of education and also it became a thought focus point in the researches (SahinYanpar, Sahin and Cakir; 2001).

The student should be ready emotionally for learning to realize learning. The attitudes are important for this. If the reasons of positive and negative attitudes can be determined in students, studies can be made to change the attitudes or to prevent the establishment of negative attitudes (Kaplan and Kaplan, 2006).The study is aimed at determining the attitudes of the 6th class students towards Mathematics course. With this aim,the attitudes of the 6th class students towards Mathematics course will be taken in the context of gender, educational situation of the family, their previous academic lives, the method and technique which the teacher used previously.

1.1. Problem Sentence

How are the attitudes of the 6th class students towards Mathematics course?

1.1.1. Sub problems of the research

Attitudes of the students towards Mathematics course, does it show any difference according to

1. Gender,
2. Education level of the mother,
3. Education level of the father,
4. Socio-economic situation of the family,
5. Academic lives of the students,
6. Presentation of the teacher?

2. Method

2.1. Model of the Research

Survey model taking place in quantitative researches group has been used in the research. Survey model is being accepted as studied researches on the explanation of fact and events by determining ideas and attitudes of the individuals in the group related with fact or events which have been carried out on large groups with the aim of determining main features of a group (Yasar, 2010).

2.2. Population and sample

The population of the research is established from 300 students of 6th class in İzmir city, Kinik province in 2013-2014 semesters. The sample of the research established from 89 students in 6th class at Mehmet Akif Ersoy Secondary School and 63 students from Imam Hatip Secondary School. 87 of the students have been girls, 65 of them have been boys. The rate of representation of the population by sample 50,6%.

2.3. Data collection instruments and collection of the data

“Mathematics Attitude Scale” which has been developed by Askar (1986) has been used as data collection instrument. The reliability of the scale is (Cronbach Alpha Coefficient) “0,96”. It has been seen that scale items have been collected under one dimension at the result of factor analysis made for validity. 10 of the items have been negative, 10 of them have been positive. These values show that this scale has been valid and reliable. This scale which has been used to determine student attitudes towards Mathematics course has been applied at schools taking place in the sample by the researchers by taking the required permissions.

2.4. Analysis of the data

Data related to sample group have been transferred to the computer environment and statistical procedures have been made by the help of SPSS program. Descriptive statistical procedures in the analysis of the data (Average, standard deviation and relative change coefficient) and one –way variance analysis to meet the averages of more than two groups have been realized. According to the results of one way variance analysis a meaningful relationship for the determined variables at “ $p < 0,05$ ” level has been found and “Tukey” test has been used for multiple comparison. Free groups used “t-test” to compare the average of two free groups.

3. Findings

3.1. Findings related to demographical properties of sample group

Table 1. Findings related to demographical properties of 6th class students

Properties		f	%	Properties		f	%
Gender	Girl	87	57,2	Mother's job	Housewife	135	88,8
	Boy	65	42,7		Civil servant	3	2,0
	Total	152	100,0		Worker	10	6,6
Father's education	Elementary school	81	53,3	Farmer	4	2,6	
	Secondary school	35	23,0	Total	152	100,0	
	High School	31	20,4	Family's income	Low	17	11,2
	University	5	3,3		Middle	114	75,0
Total	152	100,0	High		21	13,8	
Mother's education	Elementary school	93	61,1	Total	152	100,0	
	Secondary school	44	29,0	5. Class Mathematics grade	1	15	9,8
	High School	15	9,9		2	19	12,5
	University	-	-		3	50	32,9
	Total	152	100,0		4	35	23,0
Unemployed	4	2,6	5		33	21,8	
Father's job	Civil servant	11	7,2	Total	152	100,0	
	Worker	62	40,8	Presentation of the teacher	I am pleased	114	75,0
	Farmer	35	23,1		I am partly pleased	26	17,1
	Freelance	40	26,3		I am not pleased	12	7,9
	Total	152	100,0		Total	152	100,0

Information related to 6th class students taking place in the sample has been given in the table. 87 of the students are girls (57,2%), 65 of them are boys (42,7%). 93 of mothers have been graduated from elementary school (61,1%), 44 of them from secondary school (29,0%), 15 of them from high school (9,9%), 81 of fathers have been graduated from elementary school (53,3%), 35 of them from secondary school (23,0%), 31 of them from high school (20,4%), 5 of them from university (3,3%). 135 of mothers have been housewife (88,8%), 3 of them civil servants (2,0%), 10 of them workers (6,6%), 4 of them farmers (2,6%). 4 of the fathers have been unemployed (2,6%), 11 of them civil servant (7,2%), 62 of them workers (40,8%), 35 of them farmers (23,1%), 40 of them freelancers (26,3%). 17 of the families have low income (11,2%), 114 of them have middle income (75,0%), 21 of them high income (13,8%). The students' 5th class Mathematics grade; 15 of them have been one (9,8%), 19 of them have been two (12,5%), 50 of them have been three (32,9%), 35 of them have been four (23,0%), 33 of them have been five (21,8%). 114 of the students have been pleased from Mathematics presentation (75,0%), 26 of them partly pleased (17,1%), 12 of them have not been pleased (7,9%).

3.2. Sub-findings related to the sub-problems of the research

3.2.1. Sub-findings related to first sub-problem

Table 2. t-test results

Free variable	N	\bar{X}	ss.	t	df	p	
Gender	Girls	87	2,8023	0,52719	1,469	150	0,527*
	Boys	65	2,9230	0,48072			

*P<0,05

When 6th class students' attitudes towards Mathematics course have been examined in Table 2, as "t=1,469" and "p=0,527" values have been taken, a meaningful relationship could not be found at "p<0,05" level.

3.2.2. Findings related to other sub-problems

Table 3. One-Way Variance Analysis (ANOVA) Results

Dependent Variables	Squares total	Sd	Squares average.	F	p	
Mother's education	Between the groups	,523	2	,261	1,033	,358
	In-group	37,680	149	,253		
	Total	38,203	151			
Father's education	Between the groups	,540	3	,180	,708	,549
	In-group	37,663	148	,254		
	Total	38,203	151			
Mother's education	Between the groups	1,046	4	,261	1,034	,392
	In-group	37,157	147	,253		
	Total	38,203	151			
Father's job	Between the groups	2,306	4	,577	2,361	,056
	In-group	35,897	147	,244		
	Total	38,203	151			
Income of the family	Between the groups	,195	2	,097	,381	,684
	In-group	38,008	149	,255		
	Total	38,203	151			
5. Grade Mathematics grade	Between the groups	4,354	4	1,089	4,727	,001
	In-group	33,849	147	,230		
	Total	38,203	151			
Presentation of the teacher	Between the groups	,889	3	,296	1,176	,321
	In-group	37,314	148	,252		
	Total	38,203	151			

When one way variance analysis results in Table 3 have been examined, a meaningful relationship has not been found between 6th class students' mother's and father's educational situation (F=1,033, p=0,358) (F=0,708, p=0,549), father's and mother's job (F=1,034, p=0,392) (F=2,361, p=0,056), income of the family (F=0,381, p=0,684) and teacher's explaining the course (F=1,176, p=0,321) and their attitudes at p<0,05" meaningful level. It has been determined that there is a meaningful relationship between 6th class students' attitudes towards Mathematics course and their Mathematics grades in 5th class (F=6,163, p=0,001).

Table 4. Multiple comparison (Tukey) test results according to 5th class Mathematics grade

(I) Mathematics grade	N	\bar{X}	ss	(J) Mathematics grade	Average difference (I-J)	Standard error	p
1	15	2,7700	0,45032	2,00	-,11421	,16574	,959
				3,00	,07500	,14127	,984
				4,00	-,37571	,14809	,088
				5,00	-,11636	,14943	,936
				1,00	,11421	,16574	,959
2	19	2,8842	0,65702	3,00	,18921	,12932	,588
				4,00	-,26150	,13674	,315
				5,00	-,00215	,13819	1,000
				1,00	-,07500	,14127	,984
3	50	2,6950	0,51431	2,00	-,18921	,12932	,588
				4,00	-,45071(*)	,10576	,000
				5,00	-,19136	,10762	,390
				1,00	,37571	,14809	,088
				2,00	,26150	,13674	,315
4	35	3,1457	0,46263	3,00	,45071(*)	,10576	,000
				5,00	,25935	,11643	,175
				1,00	,11636	,14943	,936
				2,00	,00215	,13819	1,000
5	33	2,8864	0,30626	3,00	,19136	,10762	,390
				4,00	-,25935	,11643	,175
				Total	152	2,8714	0,50299

When the results of multiple comparison (TUKEY) test results which has been realized to determine the source of relationship between 5th class Mathematics grades of 6th class students and their attitudes towards Mathematics in Table 4, it has been determined that there is a meaningful relationship between the students whose Mathematics grade has been 3 and 4 in 5th class ($p=0,000$). When the averages from the table have been examined, the average of students whose 5th class Mathematics grade has been 3 has an average of “2,6950” whereas the average of students whose 5th class Mathematics grade has been 4 has an average of “3,1457”. The averages of two groups have been “0,4507”. According to the findings, the attitudes of students whose Mathematics grade has been 4 in 5th classes towards Mathematics has been more positive than the ones whose grades have been 3. But according to another finding, the students whose 5th class Mathematics average grade has been 5 had lower attitudes towards Mathematics than whose Mathematics grade have been 4.

4. Discussion and Conclusions

The finding related to gender variable of the research shows that girl and boy students' grades from Mathematics Attitude Scale do not show any difference. It has been observed that same and different results have been taken in the studies in which the relationship between attitude towards Mathematics and gender has been examined. In the study Isik and Cagdas (2009) made, they observed a positive increase in the students' attitudes towards Mathematics. Nevertheless they could not find a meaningful difference between attitude towards Mathematics and gender. Again Yilmaz (2006), Yenilmez and Ozabaci (2003), Akdemir (2006), Kaplan and Kaplan (2006) in their study could not find a meaningful difference between attitude towards Mathematics and gender. In another study, Aydın (2009) examined the attitude scale he applied item by item and could not find a meaningful difference between attitude towards Mathematics and gender in most of the items. These results support the idea that there is not a meaningful relationship between attitude towards Mathematics and gender. On the other hand, Yetim (2006) in a study found a meaningful difference between attitude towards Mathematics and gender. As the same Duru and Savas (2005) show that

there is a difference between the attitudes of girls and boys towards Mathematics in their study. Although Ekizoglu and Tezer (2007) could not find a meaningful difference between attitude towards Mathematics and gender statistically in their study, they determined that the attitudes of girls towards Mathematics have been higher than the attitude points of boys.

Students with high success in Mathematics show more positive attitude towards Mathematics than the ones who have lower success. This situation can be explained as the students show more positive attitudes as their success increases. Previously, in a research made by Bloom (1979), Tekindal (1988), Berberoglu (1990), Saracaloglu (2000) and Baykul (1990) it has been stated that there are positive correlations between attitude and success. These results in this research support that there is a meaningful relationship between Mathematics attitude and Mathematics success. On the other side, Baykul (1990) in one of his research presents that the attitudes towards Mathematics and Science continuously change in a negative way starting from 5th class to the last years of high schools. Mathematics attitude points have been at the top in 5th class, variable in the second period of the secondary education and stability in high school. The results which Altun and Baykul got support research findings. In the studies realized, it is stated that the students have been the least successful in Mathematics at elementary and secondary education. (Tiras, 1999).

5. Recommendations

The students' negative attitudes towards Mathematics are shown as the failure in Mathematics course. Because of this reason, developing positive attitude towards Mathematics is very important. So, required effort should be provided to be in more positive attitudes towards Mathematics starting from elementary school. This effort will affect the students' education in future in a positive manner and provide contribution for their success.

As success of the students in Mathematics course increases, their attitude towards Mathematics change in a positive manner. The teachers should ask relevant questions to the level of the students to increase the students' attitudes towards Mathematics. The students should feel the feeling of success.

Suggestions for other researchers:

- Studies can be developed to determine the attitude towards Mathematics by adding different variables to the variables used in this study and taking the sample larger.
- The relationship between the students' attitudes towards Mathematics and course success can be examined.
- The relationship between the students' attitudes towards Mathematics and their anxiety towards Mathematics can be examined.
- The differences between the interests of students towards Mathematics course and towards other courses can be examined.

References

- Aksu, M. (1991). *Problem çözme süreci*. Eskişehir: Anadolu Üniversitesi.
- Altun, M. (1998). *Matematik öğretimi*. Eskişehir: Anadolu Üniversitesi.
- Aşkar, P. (1986b). *Matematik dersine yönelik tutumu ölçen likert-tipi bir ölçeğin geliştirilmesi*. *Eğitim ve Bilim*, 11(62), 31-36.
- Aydın, S. (2009). *Ortaöğretim öğrencilerinin matematik dersi ile ilgili görüşlerinin incelenmesi* (Yayımlanmamış yüksek lisans tezi). İstanbul: Yeditepe Üniversitesi.
- Baykul, Y. (1990). *İlkokul beşinci sınıftan lise ve dengi okulların son sınıflarına kadar matematik ve fen derslerine karşı tutumda görülen değişimler ve öğrenci seçme sınavındaki başarı ile ilişkili olduğu düşünülen bazı faktörler*, Ankara: OSYM.
- Berberoglu, G. (1990). Kimyaya ilişkin tutumların ölçülmesi, *Eğitim ve Bilim*, 14 (76), 16-27.

- Bulut, S.(1988).Matematiksel kavramların gelişimi, 5., 7. ve 10. Sınıf öğrencileri üzerinde bir araştırma. *Eğitim ve Bilim*, 12, 14-22.
- Caine, R.N. and Caine, G. (1991).*Making connections: teaching and human brain*. Alexandria, Va.: Association For Supervision And Curriculum Development.
- Duru, A., and Savaş, E. (2005). Matematik öğretiminde cinsiyet farklılığı .*Erzincan Eğitim Fakültesi Dergisi*, 7(1), 35-46.
- Ekizoğlu, N., and Tezer, M. (2007). İlköğretim öğrencilerinin matematik dersine yönelik tutumları ile matematik başarı puanları arasındaki ilişki. *Kıbrıs Eğitim Dergisi*, 3, 43-57.
- Işık, I. and Çağdaşer, B. T. (2009). Yapısalcı yaklaşımla cebir öğretiminin 6. sınıf öğrencilerinin matematiğe yönelik tutumlarına etkisi. *Kastamonu Eğitim Dergisi*, 17(3), 941-954.
- Kaplan, A. and Kaplan, N. (2006).Ortaöğretim öğrencilerinin matematik dersine karşı tutumları. *Journal Of Qafqaz*, 17, 1-5.
- Lackney, J. A. (2000). *Educational facilities: the impact and role of the physical environment of the school on teaching, learning and educational outcomes*. Milwaukee, WI: University Of Wisconsin Center For Architecture And Urban Planning Research).
- Neale, D.C. (1969). The role of attitude in learning mathematics. *Aritmetic Teacher*, 16, 631-640.
- Saracaloğlu, A. S. (2000). Öğretmen adaylarının yabancı dile yönelik tutumları ile akademik başarıları arasındaki ilişki, *Eğitim ve Bilim*, 25 (115), 65-72.
- Stodolsky,S.S., Salk, S. and Glaessner, B. (1991). Student views about learning Math and Social sciences. *American Educational Reserch Journal*, 28 (1), 89-116.
- Şahin Yanpar, T., Şahin, B. and Çakır, Ö. S. (2001). İlköğretim 6. sınıf öğrencilerinin sosyal bilgiler dersinde bilişsel ve duyuşsal öğrenmelerini tahmin eden çeşitli değişkenler ve tahmin etme güçleri, *Eğitim Araştırmaları*, 3 (4), 133-138.
- Tekindal, S. (1988). Okula ilişkin tutum ile akademik başarı arasındaki ilişki. *Çağdaş Eğitim Dergisi*, 139, 29-33.
- Tektaş, M. (2009). Meslek yüksek okulu öğrencilerinin matematik tutumları ve bireysel farklılıklarının incelenmesi, *Sosyal ve Ekonomik Araştırmalar Dergisi*, 13 (19), 241-250.
- Tıraş S. (1999). *Öğrenme-öğretme açısından matematik öğretmenlerinin yeterliliği ve etkili olma düzeyleri*, D.E.Ü. Buca Eğitim Fakültesi Dergisi, Özel Sayı-II.
- Ülgen, G. (1997). *Eğitim psikolojisi*, İstanbul: AlkımYayınları
- Yaşar, M. (2010). *Ölçme ve değerlendirme ile ilgili temel kavramlar*. (Edt: S. Tekindal) Eğitimde Ölçme ve Değerlendirme. Ankara: Pegem Akademi.
- Yenilmez, K., and Özabacı, N .Ş. (2003). Yatılı öğretmen okulu öğrencilerinin matematik ile ilgili tutumları ve matematik kaygı düzeyleri arasındaki ilişki üzerine bir araştırma. *Pamukkale Üniversitesi Eğitim Fakültesi Dergisi*, 2 (14), 132-145
- Yetim, H. (2006). *İlköğretim 8.sınıf öğrencilerinin matematik ve Türkçe derslerine yönelik tutumları ile bu derslerdeki başarıları arasındaki ilişki* (Yayımlanmamış Doktora Tezi). İzmir: DokuzEylülÜniversitesi.
- Yılmaz, M. (2006). İlköğretim altıncı sınıf öğrencilerinin matematik dersine ilişkin tutumlarının bazı değişkenlere göre incelenmesi. *Milli Eğitim Dergisi*, 172, 240-249.