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Determination of Factors Affecting the Science Anxiety Levels of Secondary School Students

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Abstract – The purpose of this study is to examine the science anxiety levels of secondary school students with regard to certain variables. In this study, quantitative research method was used. The study has a relational screening model. The study has been conducted with 480 students who participated from 2 different secondary schools in İstanbul-Turkey at 2015-2016 academic year. "Science Anxiety Scale" developed by Güzeller and Doğu (2011) and Personal Information Inventory were used as data collection tools. Report card grades of science studies lesson were used as the academic success scores. SPSS 20.0 was used for the data analysis. A statistically significant difference was determined as a result of the study between the "science anxiety levels" of students and "class level", "liking science course", "liking science teacher", "weekly period of time for studying science" and "the number of scientific magazines/books at home" variables. On the other hand, the "gender" variable didn't show significant difference. It has been concluded that there is a medium level meaningful relationship between students' science anxiety levels and their academic achievement in the negative way.
Key words: Secondary school science education, science course, science anxiety

Introduction

Science education provided at the secondary school level has great importance for preparing the individual to a higher education level in addition to preparing them for the future and life (Yaşar and Anagün, 2008). Hence, it is valuable for the students to like the science course starting from the early stages of their education, to take an interest in and to attain a positive attitude towards the course. It is known that learning takes place as a result of the changes in cognitive, affective and psychomotor areas (Senemoğlu, 2010, s.92). Changes in the cognitive area encompass knowledge as well as the mental abilities that stem from knowledge. Behaviors in the affective area include the changes in the individual of concepts related with interest, attitude, intention, feeling, valuation.

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Whereas behaviors in the psychomotor area enable the development of practical skills such as the proper use of laboratory tools and equipment, preparation of the experimental setup in addition to skills related with the use of the sensory organs of the individual in coordination for education. These three areas are closely related (Çepni, 2010, s.34).

There is a close relationship between learning and anxiety which is one of the affective area components and which influences all vital activities (Cüceloğlu, 1996, s.278). Anxiety is defined as a different emotion that is experienced by everyone from time to time which forces the individual to take deep breaths (Burkovik, 2010). Tektaş (2014) puts forth that anxiety is an adjusting mechanism, a fundamental human emotion and a versatile mood that helps the individual to cope with threats which includes scientific elements, subjective emotions, physiological symptoms and behaviors (Phillips, 1984).

Even though a certain amount of anxiety can be beneficial for learning, it is put forth that advanced levels of anxiety is not suited for learning and that it prevents learning (Baymur, 1994, s.189; Cüceloğlu, 1996, s.278). Hence, advanced levels of anxiety can also be considered as a factor with adverse effects on the academic performance of the individuals in addition to lack of anxiety (Okur and Bahar, 2010, s.3632). Results of the studies carried out have put forth that anxiety and negative attitudes generally hinder the participation of the students to the teaching and learning process, thereby decreasing their performance and success levels (Chiarelott and Czerniak, 1984; Eysenck, 2001; Jegede, 2007; Linn, 1992; Osborne, Simon and Collins, 2003; Masson et.al., 2004).

Whereas science anxiety emerges as a serious prohibition for learning for the student in science education (Mallow, 2006, s.7). Mallow (1986) expresses science anxiety as disgust for or fearing of the concepts of science, scientists and activities related with science. It is put forth that science anxiety prevents the individuals from being successful in the field of science (Raymond, 2003; Udo, Ramsey and Mallow, 2004). Many people who have had science anxiety during their student years carried them over to their adulthood together with a series of negative consequences. Science anxiety which is considered as a very simple issue also prevents people from seeking a successful career (Greenburg and Malow, 1982, s.13).

It has been put forth in studies carried out for the anxiety related with science courses that high levels of science anxiety bring forth low success in science, prevents students from continuing their educations in areas related with science while also hindering their success in these areas (Atwater, Gardner and Wiggins, 1995; Czerniak and Chiarelott, 1984; Raymond,

2003; Udo, Ramsey and Mallow, 2004). Studies have been carried out for determining the levels of anxiety for learning science (Güzeller and Doğru, 2011; Kağıtçı and Kurbanoğlu, 2013; Sağır, 2014); relationship between science anxiety and gender (Mallow et.al., 2010; Mallow, 1994; Udo, Ramsey and Mallow, 2004); chemistry and chemistry laboratory anxiety (Bowen, 1999). In addition, various studies have also been carried out for developing scales to determine the science anxiety states (Güzeller and Doğru, 2011; Kağıtçı and Kurbanoğlu, 2013; Uluçınar Sağır, 2014).

It was determined as a result of various studies carried out on the importance of anxiety in learning science that there are relationships between the anxieties of the students with the bad experiences they have had during science lessons, science anxieties of their primary and secondary school teachers, lack of finding a role model, gender, scientists in popular media, ideas putting forth that students will not be able to solve science problems and that they will not be successful in science exams (Bryant et.al., 2013; Mallow et.al., 2010; Mallow, 1994; Udo, Ramsey and Mallow, 2004). Studies carried out put forth that students have science anxieties for a number of different reasons. In this regard, it is important to carry out studies for determining the factors that influence their science anxiety levels. Therefore, it was decided within the scope of this study to determine various factors that might affect the science anxiety levels of the students.

Purpose of the research

The purpose of this study is to examine the science anxiety levels of secondary school students with regard to certain variables. To this end, the following questions were tried to be answered:

1. Does the science anxiety levels of secondary school students;

a. Change at a statistically significant level with regard to gender variable?

b. Change at a statistically significant level with regard to class level variable?

c. Change at a statistically significant level with regard to liking science course variable?

d. Change at a statistically significant level with regard to liking science teacher variable?

e. Change at a statistically significant level with regard to the weekly period of time for studying science variable?

f. Change at a statistically significant level with regard to the number of scientific magazines/books at home variable?

2. Is there a statistically significant relationship between the science anxiety levels of secondary school students and their academic success?

Method

Relational screening which is one of the quantitative research methods was used in the study. Relational screening model is the defining of the relation between special events in order to reach certain goals and the determination of the existence and/or degree of change between two or more variables (Karasar, 2009). In this regard, correlation and comparison types of the relational screening model were used in this study since the relations between the variables as well as the degree and direction of these relations have been determined.

Sample of the Study

The population of this study was comprised of a group of about 1000 students continuing their educations at the 6th, 7th and 8th grades of two state secondary schools at two different districts with low socio-economic living conditions in the city of Istanbul during 2015-2016 academic year who were selected via random sampling method. Whereas the sample group of the study was comprised of a total of 480 students at the selected schools with 156 (32.5%) 6th grade, 172 (35.8%) 7th grade, 152 (31.7%) 8th grade; 248 (51.7%) female, 232 (48.3%) male students.

Data Collection Tools

A form made up of two sections was prepared for the application of the study. The first section contains a Personal Information Form with demographic information such as "gender, class level, liking science course, liking science teacher, weekly period of time for studying science, number of scientific magazine/books at home", whereas the second section contains the Science Anxiety Scale (SAS) developed by Güzeller and Doğru (2011).

Science Anxiety Scale (SAS) was developed by Güzeller and Doğru (2011). The scale is a 5 point Likert type scale with 28 items and has the structure of "I certainly agree", "I agree", "I am undecided", "I do not agree" and "I certainly do not agree". Items related with "I certainly agree" to "I certainly do not agree" were scored from 5 to 1; whereas negative items for anxiety were scored from 1 to 5. The scale was developed by Güzeller and Doğru (2011) with two sub-dimensions of "personal dimension" and "environmental dimension" and the reliability coefficient for the total scale was determined as 0.96, for the personal sub-dimension it was determined as 0.94 and for the environmental sub-dimension it was determined as 0.77. The total reliability coefficient for the scale in the study group was

determined as 0.88; whereas the values for personal and environmental sub-dimensions were determined as 0.85 and 0.69 respectively. End of year Science course report grades were used as academic success scores.

Analysis of data

SPSS 20.0 was used for data analysis. ANOVA and Independent t-test were used for the examination of the scores obtained from the scales with regard to demographic variables. Pearson correlation coefficient technique was used to examine the relationship between the science anxiety levels of the students and their academic success.

Results

In this section of the study, the results acquired within the framework of the questions that are tried to be answered have been presented.

Does the science anxiety levels of secondary school students change at a statistically significant level with regard to the variables of gender, class level, liking science course, liking science teacher, weekly period of time for studying science, number of scientific magazine/books at home?

As can be seen in Table 1, As a result of Independent t-test which was done to find out whether the secondary school students' total points and sub-dimension points of Science Anxiety Scale change according to "Gender" variable or not, the difference between the mean scores of the two groups has not been found meaningful (p>,05). (p>,05).

Table 1. Average scores for SAS and sub-dimensions and the results for the Independent t-test with regard to the "gender" variable.

Sub-Dimension	Group	N	X	SS	SH	t-test		
						t	Sd	p
Personal	Female	248	48,173	11,839	,752	,887	478	,376
	Male	232	47,207	12,028	,790			
Environmental	Female	248	11,617	2,885	,183	1,878	478	,061
	Male	232	11,112	3,003	,197			
Total	Female	248	59,790	14,063	,893	1,137	478	,256
	Male	232	58,319	14,284	,938			

As can be seen in Table 2, As a result of the ANOVA test which was done to find out whether the secondary school students' total points and sub-dimension points of Science Anxiety Scale change according to "Class level" variable or not, the difference between the mean scores of the groups has been found statistically meaningful (p<,05).

Table 2. ANOVA results according to the average scores for SAS and sub-dimensions and the "class level" variable.

Sub-Dimension	Group	N	X	SS	Var. K.	K.T.	Sd	K.O.	F	p
Personal	6th grade	156	44,180	10,534	B.Groups	3137,090	2	1568,545		
	7th grade	172	48,558	12,360	I. Groups	65014,492	477	136,299	11,508	,000
	8th grade	152	50,362	11,985	Total	68151,581	479			
	Total	480	47,706	11,928						
Environment	6th grade	156	10,365	2,325	B.Groups	278,598	2	139,299		
	7th grade	172	11,511	2,960	I.Groups	3891,650	477	8,159		
	8th grade	152	12,250	3,209	Total	4170,248	479		17,074	,000
	Total	480	11,373	2,951						
Total	6th grade	156	54,544	12,219	B.Groups	5273,044	2	2636,52		
	7th grade	172	60,069	14,656	I.Groups	90969,947	477	90,713	13,825	,000
	8th grade	152	62,611	14,350	Total	96242,992	479			
	Total	480	59,079	14,174						

LSD test from among post-hoc analysis methods was selected since, the group variances of the total "Science Anxiety Scale" and "Personal" sub-dimensions were determined to be homogeneous (L=,074, L=,120, p>.05) according to the Levene's test results applied after ANOVA which was carried out to determine the groups between which the scores obtained from SAS and its sub-dimensions differ with regard to the "class" variable and Tamhane test was selected since the group variances of the "Environmental" sub-dimensions were not determined to be homogeneous (L=,000, p<.05). According to the results of the post-hoc analysis applied for SAS; it was determined that the science anxiety scores of students enrolled at the 7th and 8th grades of secondary education were higher at a statistically significant level than the scores of the students at the 6th grade. In addition, no statistically significant difference was determined between the science anxiety scores of the students at the 7th and 8th grades. The same results were obtained for the sub-dimensions of the scale as well.

As can be seen from Table 3, the difference between the arithmetic averages of the groups was determined to be statistically significant as result of the Independent t-test applied to determine whether the average scores obtained from SAS and its sub-dimensions change according to the variable of "liking science course" or not (p<,05). The difference between the scale total score and the arithmetic averages of the groups for the "personal" and "environmental" sub-dimensions was determined to be statistically significant in favor of secondary school students who responded as "no" (p<,05).

Table 3. Independent t-test results with regard to the SAS and sub-dimensions average scores and "liking science course" variable.

Sub-Dimension	Group	N	X	SS	SH	t-test		
						t	Sd	p
Personal	Yes	445	46,456	10,680	,506	8,819	478	,000
	No	35	63,600	15,311	2,588			
Environmental	Yes	445	11,103	2,686	,127	7,541	478	,000
	No	35	14,800	3,924	,663			
Total	Yes	445	57,560	12,623	,598	9,055	478	,000
	No	35	78,400	18,310	3,094			

As can be seen in Table 4, a statistically significant difference was determined between arithmetic averages of the groups as a result of the Independent t-test carried out for determining whether the scores obtained from SAS and its sub-dimensions change according to the "liking science teacher" variable or not (p<,05). The difference between the scale total score and the arithmetic averages of the groups for the "personal" and "environmental" sub-dimensions was determined to be statistically significant in favor of secondary school students who responded as "no" (p<,05).

Table 4. Independent t-test results with regard to the SAS and sub-dimensions average scores and "liking science teacher" variable.

Sub-Dimension	Group	N	X	SS	SH	t-test		
						t	Sd	p
Personal	Yes	455	47,035	11,281	,528	5,412	478	,000
	No	25	59,920	16,376	3,275			
Environmental	Yes	455	11,178	2,810	,1318	6,428	478	,000
	No	25	14,920	3,239	,648			
Total	Yes	455	58,213	13,349	,626	5,909	478	,000
	No	25	74,840	19,143	3,829			

As can be seen in Table 5, a statistically significant difference was determined between the arithmetic averages of the groups for the scores obtained from SAS and its sub-dimensions as a result of the ANOVA test applied to determine whether the scores obtained from SAS and its sub-dimensions change according to the "weekly period of time for studying science" variable (p<.05).

Table 5. ANOVA results according to the SAS and its sub-dimensions average scores and the "weekly period of time for studying science" variable.

Sub-Dimension	Group	N	X	SS	Var. K.	K.T.	Sd	K.O.	F	p
Personal	0.5-1 hour	120	52,400	4,707	B.Groups	3844,924	2	1922,462	14,260	,000
	1-2 hours	201	46,980	10,460	I. Groups	64306,658	477	134,815		
	3-4 hours	159	45,082	10,275	Total	68151,581	479			
	Total	480	47,706	11,928						
Environmental	0.5-1 hour	120	12,383	3,510	B.Groups	164,026	2	82,013	9,765	,000
	1-2 hours	201	11,075	2,687	I. Groups	4006,222	477	8,399		
	3-4 hours	159	10,987	2,633	Total	4170,248	479			
	Total	480	11,373	2,951						
Total	0.5-1 hour	120	64,783	17,403	B.Groups	5555,988	2	2777,994	14,61	,000
	1-2 hours	201	58,055	12,421	I. Groups	90687,004	477	190,120		
	3-4 hours	159	56,070	12,271	Total	96242,992	479			
	Total	480	59,079	14,175						

Tamhane test was selected since the group variances of total SAS were not determined to be homogeneous (L=,000, L=,000, L=,000,p<.05) according to the Levene's test results applied after ANOVA which was carried out in order to determine the groups according to which scores obtained from SAS and sub-dimensions change according to the "weekly period of time for studying science". According to the post-hoc analysis results applied for SAS; the SAS scores of students with a weekly study time of "0.5-1 hour" was determined to be higher at a statistically significant level in comparison with those of the students with wekkle study periods of "1-2 hours" and "3-4 hours". In addition, no statistically significant difference was determined between the Science Anxiety scores for students with weekly study periods of "1-2 hours" and "3-4 hours". The same results were obtained for the sub-dimensions of the scales as well.

As can be seen from Table 6, a statistically significant difference was determined between the group arithmetic averages for the scores obtained from SAS and its sub-dimensions as a result of the ANOVA test applied to determine whether the scores obtained from SAS and its sub-dimensions differ with regard to the "number of scientific magazines/books at home" variable (p<.05).

Table 6. ANOVA results according to the SAS and sub-dimensions average scores and the "number of scientific magazines/books at home" variable

Sub-Dimension	Group	N	X	SS	Var. K.	K.T.	Sd	K.O.	F	p
Personal	0-2 number	349	49,032	12,237	B.Groups	2416,234	2	1208,117	8,767	,000
	3-5 number	58	42,897	8,996	I. Groups	65735,348	477	137,810		
	More than 5 number	73	45,192	11,186	Toplam	68151,581	479			
	Total	480	47,706	11,928						
Environmental	0-2 number	349	11,567	3,013	B.Groups	81,193	2	40,597	4,736	,009
	3-5 number	58	10,293	2,069	I. Groups	4089,055	477	8,572		
	More than 5 number	73	11,301	3,085	Toplam	4170,248	479			
	Total	480	11,373	2,951						
Total	0-2 number	349	60,599	14,515	B.Groups	3305,992	2	1652,996		,000
	3-5 number	58	53,190	10, 690	I. Groups	92937,000	477	194,836		
	More than 5 number	73	56,493	13,493	Total	96242,992	479			
	Total	480	59,073	14,175						

LSD test from among post-hoc analysis techniques was selected since the group variances of total SAS and its "Personal" sub-dimenson were determined to be homogeneous (L=,082,L=,095, p>.05) according to the Levene's test result applied after ANOVA carried out to determine the groups among which scores obtained from SAS and its sub-dimensions change according to the "number of scientific magazines/books at home" variable and Tamhane test was selected since the group variances of the "environmental" sub-dimensions were not determined to be homogeneous (L=,004, p<.05). According to the post-hoc analysis results applied for SAS; it was determined that the SAS scores of students with number of scientific magazines/books at home of "0-2" was higher at a statistically significant level in comparison with the SAS scores of students with "3-5" or "more than 5" scientific magazines/books at home. In addition, no statistically significant difference was determined between the SAS scores of students with "3-5" or "more than 5" scientific magazines/books at home. The same results were obtained for the sub-dimensions of the scales as well.

Is there a statistically significant relationship between the science anxiety levels of secondary school students and their academic success?

It was determined as a result of the Pearson correlation coefficient technique carried out to determine whether there was a statistically significant relationship between the science

anxiety levels of secondary school students and their academic success that there was a moderate and negative statistically significant relationship between the scales and sub-dimensions (Table 7).

Table 7. Results for the Pearson correlation coefficient technique applied to determine the relationships between SAS and its sub-dimensions and academic success.

		SAS			
		Personal	Environmental	Total	Academic Success
SAS	Personal	1	r = ,709**	r = ,989**	r = - ,444**
	Enviromental	p<.01	1	r = ,805**	r = - ,390**
	Total	p<.01	p<.01	1	r = -,455**
Academic Success		p<.01	p<.01	p<.01	1

Results and Discussion

The study was carried out to examine the science anxiety levels of secondary school students with regard to certain variables.

It was determined as a result of the study results that the Science Anxiety Scale total and sub-dimensions scores of secondary school students did not change at a statistically significant level with regard to the "gender" variable. Similar results have been obtained by different researchers as well (Kağıtçı, 2014; Uluçınar and Sağır, 2012; Kurbanoğlu, 2014). However, various other studies carried out have put forth a statistically significant difference in favor of female students as a result of the comparison made between the science anxiety levels of female and male students (Jegede, 2007; Malow, 2010; Udo et.al., 2004 ; Mallow, 1994). Jegede (2007) carried out a study to determine whether there is a gender based difference between the chemistry learning anxiety level of secondary school students as a result of which it was determined that female students have higher anxiety levels in comparison with male students. The reason for this may be due to the fact that female students find the number of topics high, that they have to perform a lot of mathematical calculations, that they believe they will fail in the class and that they have an anxiety towards the lesson

application methods of the teachers. In addition, it was determined as a result of studies carried out by Hassan (2008) and Akçöltekin and Doğan (2013) that female students have lower science anxiety levels. It can be considered that the reason for this result obtained in our study may be the fact that equal learning environments are provided to all students in our country in line with the conditions of the developing and changing world along with the innovations in the field of education.

It was observed according to the study results that secondary school students put forth a statistically significant difference with regard to the total scores for the Science Anxiety Scale and its sub-dimension scores for the "class level" variable and that the science anxiety levels of students increase with increasing class level. Highest science anxiety level was determined in 8th grade students. Similar results have been obtained by different researchers as well (Genç, 2013; Hassan, 2008; Uluçınar and Sağır, 2012). Contrary to the results obtained from the study, Kağıtçı (2014) determined that there was no statistically significant change in the science anxiety levels of students with increasing class level. The reason for the result obtained in our study might be due to the fact that expectations from them increase with increasing class levels even though they start the year with positive thoughts and that students in the 8th grade will enter the TEOG exam by the Ministry of National Education which is a high school entrance exam that is very important for their future academic lives.

It was determined as a result of the study results that the Science Anxiety Scale total score and sub-dimension scores vary at a statistically significant level according to the "liking science course" variable and that the difference between the arithmetic averages of groups is in favor of secondary school students who do not like science course. Parallel to the results of this study, Akçöltekin and Doğan (2013) evaluated the students with regard to their interest towards science course putting forth that students who like science course also like studying science. Similarly, Mallow (1994) also determined that negative attitudes towards science are related with science anxiety. The reason for the result obtained in our study might be the fact that the interest of students increase as long as they like the course and that accordingly they have lower anxiety levels.

It was determined as a result of the study results that the Science Anxiety Scale total score and sub-dimension scores of secondary school students varied at a statistically significant level with regard to "liking science teacher" variable and that the arithmetic averages of groups favored the students who do not like the science teacher. Parallel to the findings of the study, Gömleksiz and Yüksel (2003) determined as a result of their studies that

primary school students feel anxiety towards science course which is due to a lack of communication with the teacher. Kaya and Yıldırım (2014) carried out a study for examining the sources of science anxieties of unsuccessful students as a result of which they put forth that one of the reasons for science anxiety might be due to the attitude of the teacher. It was put forth in another study by Udo, Ramsey and Mallow (2004) that the behaviors of teachers as role models are effective in the formation of science anxiety and that there is a strong correlation between the attributes of the teacher and the anxiety and interest of the students towards science. Jegede (2007) carried out a study in which it was put forth that science anxiety is due to the teacher, the teaching method of the teacher, shortness of teaching material. It was also put forth in different studies that the attitude of the teacher is effective in the formation of anxieties of students towards the course (Mallow et.al., 2010; Westerback and Primavera, 1992). The reason for the result obtained in our study might be the fact that parallel to the students liking the science teacher, their interest towards the course will increase thus resulting in lower anxiety levels.

According to the study results, it was determined that the Science Anxiety Scale total and sub-dimension scores put forth a statistically significant difference with regard to the "weekly period of time for studying science" variable and that there was an increase in the science anxiety level with decreasing weekly period of time for studying science. It was determined as a result of a literature survey that there are no studies examining the relationship between science anxiety of students and the weekly period of time they study science but that Culler and Holahan (1980) have determined in their study that students with high exam anxiety have inefficient study habits. The reason for the result obtained in our study might be the fact that anxiety levels of students increase when they think they will be unsuccessful because they spare a short amount of time for studying science due to their lack of interest.

According to the results of the study, it was determined that the Science Anxiety Scale total and sub-dimension scores for secondary school students put forth a statistically significant difference with regard to the "number of scientific magazines/books at home" variable and that there was an increase in the science anxiety level with decreasing number of scientific magazines/books at home. No study examining the relationship between the science anxiety levels of students and the scientific magazines/books at home was determined as a result of the literature survey carried out. Only, Çetin and Kırbulut (2006) and Yenice, Saydam and Telli (2012) determined in their studies that the number of scientific magazines/books at home is an important factor in determining the motivation levels of

students. The reason for the result obtained in our study might be the fact that students are not interested in scientific issues as a result of their dislike towards science course thus resulting in a small number of scientific books.

It was determined as a result of the study that there was a moderate and statistically significant relationship in the negative direction between the Science Anxiety scale and sub-dimensions for secondary school students and their academic success. This result indicates that students with low academic success have higher science anxiety levels. Parallel to the result obtained from this study, Czerniak and Chiarelott (1984) along with Atwater, Gardner and Wiggins (1995) also indicated in their respective studies that high levels of science anxiety bring with it low science success thus emphasizing science anxiety as one of the factors affecting success in science. Mallow and Greenburg (1982) put forth that there is a science anxiety among students but also indicated that it is a less understood and rarely handled issue. Raymond (2003) along with Udo, Ramsey and Mallow (2004) indicated that science anxiety prevents students from taking an education in the fields of science as well as preventing them to be successful in these fields. There are various studies in literature which indicate an inverse relationship between anxiety and success (Czerniak and Chiarelott, 1985; Masson et.al., 2004; Zoller and Ben-Chaim, 1988). In addition, there are also studies which put forth that there is no statistically significant difference between anxiety scores and levels of success contrary to the results obtained in this study (Zeybek, 2012). When the increase in science anxiety level due to reasons determined in our study as dislike towards science course, dislike towards the science teacher, short weekly period of time for studying science, small number of scientific magazines/books at home; a decrease in success levels might be considered possible.

Suggestions

Since the results of the study are limited with students at 6th, 7th and 8th grades during the 2015-2016 academic year in two state secondary schools in two different districts in the city of Istanbul with low socio-economic living conditions, similar longitudinal studies may be carried out in the city of Istanbul/different cities with different sample groups for examining the change in science anxiety and factors affecting the science anxiety level can be determined during the process.

In the light of the data acquired from the study, preparation of learning environments in which students participate actively; paying more attention to the relationship between teachers and students by drawing attention to the importance of teacher-student relations in affecting

anxiety; use of teaching methods by teachers for increasing the interest of students towards the course and suggestions by the teachers to the students to read books and magazines that might raise their interest towards the course in order to decrease the science anxiety levels of students.

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