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Approaches of Intellectually Gifted and Non-Gifted Students towards the Science Course*

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ABSTRACT: Science and technology course which has been started to be given from the 4th grade in elementary level in the Turkish teaching programme, has a considerable place for both its requirement in today's conditions and the fact that it prepares students for high school level courses. Therefore, it is significant that all students should develop positive views towards it as early elementary grades. In addition to the average people, intellectually gifted ones are also valuable since they may contribute to their country and themselves by using their potential. For this reason, a survey study was conducted with 141 participants to examine the tendencies of intellectually gifted and non-gifted students towards science and technology course. In data gathering, a questionnaire developed by the researchers was utilized. The results indicate that intellectually gifted students possess more positive tendencies towards science than non-gifted students.

Key words: intellectually gifted students, science, approaches.

INTRODUCTION

Beginning from 1998, an 8 year of elementary education has been a must for every student in Turkey and since 2004 teacher-centered traditional teaching methods have been left. Instead, the education system moved to a student-centered constructivist model. The first 5 year period of these 8 years constitutes the elementary first level and the other 3 years constitute the elementary second level. There has been a national examination between the elementary two levels. Students are placed to various high schools such as science, social studies, technical and vocational as a result of their written exam scores which are administered in the end of these 8 years. They get a 4 year high school education in those schools. During this education, students are encouraged to be educated in different areas such as science, social sciences, language or sports according to their interest areas and abilities. Despite the fact that interest is the major factor for this grouping, Buluş Kırıkkaya (2010) reports that the number of alternative occupations to choose is the biggest influence for 10th grade high school science students in addition to their interest areas. After the high school education, students take the national university entrance exam and they are placed to the universities according to their choices in case they get appropriate scores. On the other hand, beginning from 2012 a new model which divides education process into 3 groups of 4 years named *4+4+4* has been majored. The first 4 years constitute the elementary education and the followings refer to middle and high school. The time of our research corresponds to first mentioned part. Hence, we needed to make a brief introduction about the education system in Turkey in this way.

Science course is a fundamental course in elementary education like mathematics, social sciences and language. In Turkey, it is given as a separate course beginning from the 4th grade in elementary first level to the end of 8th grade in elementary second level. In the years 1, 2 and 3, some of its topics are given under the course *Life Sciences.* This course has a considerable place for both its requirement in today's conditions and the fact that it prepares background for high school. This course is significant for the development of countries in science (Kurtuluş & Çavdar, 2011) because one of the fundamental aims of science and technology lesson is to develop scientifically literate people (Bahar ed., 2006: 45). With the benefits of that course, it would be possible to develop people who can catch the time and who can use, make research on and improve the technology it brought (Doğan, Çakıroğlu, Bilican & Çavuş, 2009: 5).

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Moreover, with the help of it; learning which prepares basis for high school level physics, chemistry and biology lessons are transferred to the students in addition to adding skill to the students for using the technology which is the application of science. Due to the reasons mentioned, students' points of views related to science course should be considered since they may influence their education status. Positive attitudes and approaches towards the science course might affect students till they study at high school and college as well. On the other hand, negative attitudes towards it might take students away from this area.

Opinions of the students about the science course may affect their perspectives on daily life. Hence they should be considered seriously. Different factors, such as family, teacher, media and intellectual level as well, may form students' views about this situation. From this thinking, this paper focuses on intellectually gifted and intellectually non-gifted students. Renzulli (1978) makes such a definition for the gifted and talented students:

> Giftedness consists of an interaction among three basic clusters of human traits - these clusters being above average general abilities, high levels of task commitment, and high levels of creativity. Gifted and talented children are those possessing or capable of developing this composite set of traits and applying them to any potentially valuable area of human performance. Children who manifest or are capable of developing an interaction among the three clusters require a wide variety of educational opportunities and services that are not ordinarily provided through regular instructional programs.

As can be seen in the definition above, some researchers tend to use the terms *gifted and talented* together (Akarsu, 2004; Ersoy & Avcı, 2004). However, in this study, students who have high intellectual ability are addressed and those intellectually gifted students are described as gifted in short form.

Education of the gifted students is highlighted in case that they possess high potentials for economical, strategic and sociological areas as well as scientific and technologic areas (Bilgili, 2004). Also, Akarsu (2004) describes gifted students as valuable sources who can contribute to their own country, to the countries they migrate and to whole civilization in their own areas such as science, technology, art and service in today's conditions, which are based on competition on knowledge and creativity. Due to those reasons, interest of the students in science and technology course and improvement of their present potentials in that area is precious for both themselves and the societies they live in.

Literature Review

When the literature is examined, it is seen that studies on science are generally related to students' attitudes towards science. Even meta-analyses of such studies are present (Weinburgh, 1995; Osborne, Simone & Collins, 2003). And the majority of those attitude studies were conducted with average intelligence level students (Ebenezer & Zoller, 1993; Boone, 1997; Francis & Greer, 1999; George, 2000; Pardo & Calvo, 2002; Jarvis & Pell, 2005; Jenkins & Nelson, 2005; George, 2006; Çakır, Şenler & Taşkın, 2007; Kind, Jones & Barmby, 2007; Akpınar, Yıldız, Tatar & Ergin, 2009). Studies involving intellectually gifted students at this aspect seem to be in the minority (Harty & Beall, 1984; Barrington & Hendricks, 1988; Caleon & Subramaniam, 2008). However, there is need for qualitative studies which highlight and compare intellectually gifted and non-gifted students' opinions to enhance teaching.

In terms of the evaluations of 2004 teaching program in Turkey, Ocak and Ergün (2006) researched the opinions of elementary 4th and 5th graders' and Yangın (2007) researched the opinions of classroom teachers and elementary 4th and 5th graders. Both studies indicated positive opinions about the constructivist model applied in the country. In the light of study findings, Yangın (2007) recommended the investigation of students' affective looks on science and technology in future program studies. Çepni and Çoruhlu's (2010) study conducted with 2 science teachers and elementary level students indicated that most of the students enjoyed science course and their reasons were listed as follows: (i) Because science is amazing. (ii) Because I like the teacher. iii) Because I like experimenting. (iv) Because there are interesting topics. (v) Because it is numerical.

In addition to the studies of individual researchers, national ministry of education provides country wide reliable reports about education. According to the results of the Ministry of Turkish National Education Research and Improvement Service Science Report, elementary second level students' opinions about science course are as follows (MEB, 2007): (1) Students who like this course very much and who like this course constitute 68.2 % of the 6th grades. This ratio is 61.4 % for the 7th grades and 66.2 % for the 8th grades. (2) The students who like this course a little constitute 24.1 % of the 6th grades; 29.1 % of the 7th grades and 26.5 % of the 8th grades. (3) The students who do not like this course were found to be 7.3 % of the 6th grades, 9.6 % of the 7th grades and 8.0 % of the 8th grades.

In contrast to the positive opinions found in elementary level, studies involving high school level students resulted in the following consequences (Buluş Kırıkkaya, 2010): Teacher factor was the least important factor for the students to study in the science branch. Students argued that science course did not direct them science. Half of the students did not believe that science programme make them enjoy science; the programme did not direct them towards science and make them know scientists.

When the students were analyzed in terms of gender, females and males were shown to demonstrate different tendencies towards science (Jones, Howe & Rua, 2000; Miller, Blessing & Schwartz, 2006). Jones, Howe and Rua (2000) found out that as out of curriculum experiences, boys enjoyed batteries, electrical toys, fuses and pulleys whereas girls mentioned baking, knitting, sewing and growing plants. The research showed also that their career plans differed from each other. Miller, Blessing and Schwartz's (2006) study indicated that male students enjoyed science and mathematics more than females; females enjoyed literature and language more than males. Also, female students were found to be keener on courses such as biology which focused on human.

As can be understood from the above mentioned studies, gender and grade level can be influential on students' views on science. However, a gap is present in the literature related to the opinions of intellectually gifted students' opinions since much of the studies concern mainstream students. In addition, there are not studies which show the change in students' opinions with respect to grade level. Present studies were limited to only elementary first level or second level. Some of the studies only consider only one grade of high school. No more detailed research can be found at this respect.

The Aim and Significance of the Study

The opinions of the students about science are worth studying since they influence their academic achievement, future career plans and also for the fact that it is an indispensable tool for accommodating today's scientific and technologic conditions. On the other hand, there are not studies comparing intellectually gifted and non-gifted students in terms of those aspects. Hence, present study intends to compare intellectually gifted and non-gifted students who are studying at different grades of elementary school by determining their approaches to science course and their reasons.

As a result of this study, it will be possible to find out whether there are differences between those two groups of students; and if present, the reasons of the differences will also be determined. In the light of the findings, suggestions to prevent students' negative approaches can be presented and contributions to both science and gifted education literature are expected.

Research Questions

The following questions are intended to be answered in the study:

- Do intellectually gifted and non-gifted students differ in terms of their interest level towards science with respect to gender/elementary grade level/preschool education?
- Do intellectually gifted and non-gifted students' science course enjoyments differ in terms of gender/elementary grade level?
- How do intellectually gifted and non-gifted students' reasons vary for enjoying science/not enjoying science/enjoying science to a considerable degree?

When the research questions are answered, it would be possible to find out the effect of grade level, gender and preschool education status on their interests and opinions towards science course. So, the tendencies of intellectually gifted and non-gifted students will be clarified and a comparison could be made for both sides. Suggestions to improve present status of students if needed (in terms of teaching activities etc.) will be presented.

METHODS

Study Sample

The study was conducted in 2010-2011 academic year, fall term, İstanbul city in Turkey. The students were selected from the same elementary school which educated both intellectually gifted and non-gifted students in the content of a project. This school is the only one that educates elementary level gifted students in Turkey. The study group consists of 61 gifted and 80 non-gifted students and their distribution with respect to gender and intelligence level is given in Table 1.

Table 1. Distribution of the Sample with respect to Gender and Intelligence Level

Gender	Gifted		Non-gifted	
	N	%	N	%
Female	19	31.1	30	37.5
Male	42	68.9	50	62.5
Total	61	100.0	80	100.0

The participants' education level varies from elementary 4th to 8th grade. In both groups, the percentages of male students are higher than the percentage of females. 31.1 % of the gifted are females whereas 68.9 % of them are males. On the other hand, 37.5% of non-gifted are females whereas 62.5 % of them are males. Table 2 shows the distribution of the participants with respect to intelligence and grade level.

Table 2. Frequency Distribution of the Sample with respect to Elementary Grade Level

	Grades					
	4th	5th	6th	7th	8th	Total
Gifted	22	8	6	18	7	61
Non-gifted	25	15	8	22	10	80
Total	47	23	14	40	17	141

According to Table 2, in both groups, half of the participants are from elementary 1st level (4th and 5th years) and half of them are from elementary 2nd level (6th, 7th and 8th years). Table 3 demonstrates the distribution of the sample with respect to intelligence and preschool education status.

Table 3. Distribution of the Sample with respect to Intelligence Level and Preschool Education Status

Preschool education	Gifted		Non-gifted	
	N	%	N	%
Received	54	88.5	70	87.5
Not received	7	11.5	10	12.5
Total	61	100.0	80	100.0

Table 3 shows that most of the participants in both groups received preschool education and their ratios are close to each other. 88.5 % of the gifted and 87.5 % of non-gifted students received preschool education.

Since in this study it is aimed to make a comparison, the participants of the study were selected from the same school specially. The elementary school involved in the present study gives education to both intellectually gifted and non-gifted students at the same time in terms of

a project conducted for intellectually gifted students in Turkey. The intellectually gifted students are accepted to this school after special exams and interviews. Hence, the school has the characteristic to be unique in Turkey for that aspect. Gifted students are integrated with their non-gifted peers in education process while in certain courses such as mathematics, science and language they are provided with special education due to their giftedness.

The sample of the study was selected via non-random sampling – purposeful sampling. This method allows the researcher to select information rich cases which are appropriate for the purpose of the study and to explain the phenomenon and relationships (Büyüköztürk, Çakmak, Akgün, Karadeniz & Demirel, 2010: 89).

Data Tool

A questionnaire which involved open ended, descriptive and multiple choice questions was developed by the researchers to collect data. While developing research instrument, students' characteristics and Turkish Educational System were taken into consideration. To check the validity of the questions, the instrument was administered in various districts to a total of 120 students as pilot study. Those students were selected from three elementary schools in three different districts of western Turkey. In the light of the findings, the intelligibility of the questions was discussed by the researchers and appropriate changes such as rewording made on the questions. According to the results of the pilot study, no question was omitted from data tool. Instead, additions or rewording were made. For example, in the construction of the question related to science enjoyment, the response *to a considerable degree* was needed in addition to the responses *yes* and *no*. This response was added to the instrument after the pilot study and we suppose that this response stems from students' uncertainty or changeability of the opinions about science teachers or topics. Hence, they cannot state a definite yes or no as an answer; instead they move between two of them. For this reason, *to a considerable degree* (*to a c.d.*) was added among the responses to solve this problem. The instrument was retested on the students with its revised version with the same 120 students and the final form was gained. The questionnaire consisted of two parts. The first part dealt with the demographic characteristics of the sample such as year of birth, gender, grade level, preschool education status and the second part involved questions focusing on identification of the ideas on science and technology course. At this respect, the research instrument involved mixed types of questions such as multiple choice, descriptive and open ended questions according to the question's focus and it is present in the appendix.

Procedure

A survey study was conducted in order to answer the research questions. This type of study aims to collect information to investigate a group's certain characteristics (Büyüköztürk et al., 2010: 16). The questionnaires were implemented to the participants in the supervision of the researchers.

Data Analysis

Descriptive statistics and content analysis were used to analyze the collected data. Descriptive questions were analyzed by means of descriptive statistics – cross tabulations (for question 6 and 7) via SPSS 16 packet programme.

In the analysis of open ended questions (question 8), content analysis was utilized. Proper themes were constructed to gather related themes and relations to explain data (Yıldırım & Şimşek, 2008: 227). As a result, for each theme, frequency and percentage distributions were provided to quantify data and they were compared for the gifted and non-gifted students.

RESULTS

Intellectually Gifted and Non-Gifted Students' Interest Levels towards Science

Students were asked to specify how interested they were in the science course. Their responses were presented on Table 4. Students' interest levels were classified as *extremely,*

quite, slightly, scarcely and *no interest.* No student was found to show no interest towards science. Hence, this response was not placed on the table.

Table 4. Interest Level in Science with respect to Intelligence

Interest Level	Gifted		Non-gifted	
	N	%	N	%
Extremely	35	57.4	23	28.8
Quite	21	34.4	41	51.3
Slightly	3	4.9	14	17.5
Scarcely	2	3.3	2	2.5
Total	61	100.0	80	100.0

According to Table 4, more than half of the gifted students enjoyed science extremely (57.4 %); however the same ratio was less for the non-gifted (28.8 %). When the total of positive responses namely *extremely* and *quite* was evaluated together, it makes 91.8 % for the gifted and 80.1 % for the non-gifted. The values of *extremely* and *quite* get the opposite for gifted and non-gifted. The percentage of the response *extremely* (57.4 %) is bigger for the gifted whereas the percentage of *quite* (51.3 %) is bigger for the non-gifted and their percentages are closer to each other in each group. When the negative responses *slightly* and *scarcely* were considered together, non-gifted students (20.0 %) were found to be less interested in science than the gifted (8.2 %).

When the data was analyzed in terms of gender, the percentages on Table 5 was obtained.

Table 5. Interest in Science with respect to Gender and Intelligence

	Gender	Extremely		Quite		Slightly		Scarcely		Total	
		N	%	N	%	N	%	N	%	N	%
Gifted	Female	15	78.9	2	10.5	2	10.5	0	0	19	100.0
	Male	20	47.6	19	45.2	1	2.4	2	4.8	42	100.0
Non-gifted	Female	9	30.0	16	53.3	4	13.3	1	3.3	30	100.0
	Male	14	28.0	25	50.0	10	20.0	1	2.0	50	100.0

According to Table 5, both intellectually gifted (78.9 %) and non-gifted (30.0 %) female students seemed to be more interested in science extremely than male students. No gifted female was found to be scarcely interested in science; however there were such gifted males (4.8 %) and non-gifted males (2.0 %) and females (3.3 %) as well.

When the grade levels of students were considered, their interest levels towards science varied as presented on Table 6.

Table 6. Interest in Science with respect to Intelligence and Grade Level

	Grade Level	Extremely		Quite		Slightly		Scarcely		Total	
		N	%	N	%	N	%	N	%	N	%
Gifted	4th	17	77.3	5	22.7	0	0	0	0	22	100.0
	5th	4	50.0	4	50.0	0	0	0	0	8	100.0
	6th	4	66.7	2	33.3	0	0	0	0	6	100.0
	7th	7	38.9	7	38.9	3	16.7	1	5.6	18	100.0
	8th	3	42.9	3	42.9	0	0	1	14.3	7	100.0
Non-gifted	4th	10	40.0	11	44.0	4	16.0	0	0	25	100.0
	5th	4	26.7	10	66.7	1	6.7	0	0	15	100.0

	6th	3	37.5	4	50.0	1	12.5	0	0	8	100.0
	7th	3	13.6	10	45.5	7	31.8	2	9.1	22	100.0
	8th	3	30.0	6	60.0	1	10.0	0	0	10	100.0

Table 6 indicated that gifted students' positive responses constituted 100.0 % in elementary 1st level (4th and 5th grades). When passed to elementary 2nd level (6th, 7th and 8th grades), there were negative responses in gifted ones. Non-gifted students possessed negative interests both in elementary 1st and 2nd levels. In both student groups, there was a fall in interest levels "extremely" when passing from 4th to 5th grade and 6th to 7th grade. Conversely, there was a rise in this interest level when passing from 5th to 6th; 7th to 8th grades. In gifted students, the percentages of quite is less or equal to the percentages of extremely. On the other hand, for non-gifted students the percentages of quite is more than the percentages of extremely. When the percentages of slightly and scarcely are also considered, gifted students are more interested in science than the non-gifted.

Students' interest levels towards science varied as on Table 7 with respect to preschool education status.

Table 7. Interest in Science with respect to Preschool Education Status and Intelligence

Preschool Education		**Extremely**		**Quite**		**Slightly**		**Scarcely**		**Total**	
		N	%	N	%	N	%	N	%	N	%
Gifted	**Received**	31	57.4	20	37.0	2	3.7	1	1.9	54	100.0
	Not received	4	57.1	1	14.3	1	14.3	1	14.3	7	100.0
Non-gifted	**Received**	21	30.0	37	52.9	10	14.3	2	2.9	70	100.0
	Not received	2	20.0	4	40.0	4	40.0	0	0	10	100.0

Table 7 reported that there was not a difference among gifted that enjoyed science extremely in terms of preschool education. 57.4 % of the gifted who received preschool education enjoyed science extremely whereas 57.1 % of them who did not receive such an education enjoyed science extremely. However, when the negative responses (slightly and scarcely together) were considered, it was noticeable that students who were less interested in science had a higher percentage among the ones who did not receive preschool education in both gifted (28.6 %) and non-gifted students (40.0 %) when compared to those who received preschool education among gifted (5.6 %) and among non-gifted (17.2 %).

Intellectually Gifted and Non-Gifted Students' Science Course Enjoyment

When the students were asked whether they enjoyed the science course, the findings were obtained as shown on Table 8.

Table 8. Enjoyment from Science with respect to Intelligence

Do you enjoy science?	**Gifted**		**Non-gifted**	
	N	%	N	%
Yes	46	75.4	58	72.5
No	1	1.6	8	10.0
To a c.d.	14	23.0	14	17.5
Total	61	100.0	80	100.0

As can be seen on Table 8, students who enjoyed science were about the same value among both gifted (75.4 %) and non-gifted students (72.5 %). However, the students who did not enjoy science were more frequent among non-gifted (10.0 %) than the gifted (1.6 %).

Conversely, students who enjoyed science to a considerable degree was more frequent among the gifted (23.0 %) than non-gifted (17.5 %).

When the responses were evaluated in terms of gender, the distribution of their enjoyment was as follows (Table 9):

Table 9. Enjoyment from Science with respect to Gender and Intelligence

Gender		Yes		No		To a c.d.		Total	
		N	%	N	%	N	%	N	%
Gifted	Female	16	84.2	0	0	3	15.8	19	100.0
	Male	30	71.4	1	2.4	11	26.2	42	100.0
Non-Gifted	Female	24	80.0	2	6.7	4	13.3	30	100.0
	Male	34	68.0	6	12.0	10	20.0	50	100.0

Females who enjoyed science in both gifted (84.2 %) and non-gifted (80.0 %) were more than the males among gifted (71.4 %) and among non-gifted (68.0 %). Similarly, students who did not enjoy science and who enjoyed science *to a c. d.* were more common among male students than females. There was no gifted female who did not enjoy science.

When the responses were considered in terms of grade level, the distribution of their enjoyment was as followed (Table 10):

Table 10. Enjoyment from Science with respect to Grade Level and Intelligence

Grade Level		Yes		No		To a c.d.		Total	
		N	%	N	%	N	%	N	%
Gifted	4th	21	95.5	0	0	1	4.5	22	100.0
	5th	7	87.5	0	0	1	12.5	8	100.0
	6th	4	66.7	1	16.7	1	16.7	6	100.0
	7th	11	61.1	0	0	7	38.9	18	100.0
	8th	3	42.9	0	0	4	57.1	7	100.0
Non-gifted	4th	23	92.0	0	0	2	8.0	25	100.0
	5th	13	86.7	0	0	2	13.3	15	100.0
	6th	4	50.0	3	37.5	1	12.5	8	100.0
	7th	10	45.5	4	18.2	8	36.4	22	100.0
	8th	8	80.0	1	10.0	1	10.0	10	100.0

According to Table 10, the percentages of gifted students who enjoyed science decreased with increasing grade level whereas the percentage of students who enjoyed science *to a c. d.* increased with increasing grade level. A similar situation was also valid for the non-gifted; however passage from the 7th to 8th grade showed a different tendency. The percentage of the students who enjoyed science showed an increase when passing from the 7th to 8th grade and the percentage of the students who enjoyed science *to a c. d.* showed a decrease when passing from the 5th to 6th and 7th to 8th grade for the non-gifted. Gifted students who do not enjoy science were found only in the 6th grade. On the other hand, non-gifted students were found not to enjoy science in all elementary 2nd level grades. There was a sharp increase in non-gifted students who did not enjoy science when passed from the 5th to 6th grade in other words when passing from elementary 1st level to 2nd level.

Reasons for Science Course Enjoyment

Students indicated their reasons to enjoy science course as on Table 11.

Table 11. Reasons for Enjoying Science

Themes	Gifteds' Opinions		Non-Gifteds' Opinions	
	N	%	N	%
It is joyful	37	35.2	37	37.8
We perform experimentation	23	21.9	17	17.3
I am successful in this course	12	11.4	6	6.1
It teaches something	11	10.5	17	17.3
It has interesting topics	8	7.6	9	9.2
I love the teacher	5	4.8	5	5.1
It is scientific	4	3.8	2	2.0
It is numeric	2	1.9	2	2.0
It is related to future job	1	1.0	2	2.0
It is related to daily life	1	1.0	1	1.0
It develops intelligence	1	1.0	0	0
Total	105	100.0	98	100.0

The reasons stated by the students were shown on Table 11. When the percentages were compared, the factors that were more effective on gifted students when compared to non-gifted ones on enjoying science could be listed as (i) Experimenting (21.9 %), (ii) Achievement (11.4 %), (iii) Scientific aspect of the course (3.8 %) and (iv) Intelligence development (1.0 %). And the following factors were found to be more important for non-gifted participants: (i) Joyfulness of the course (37.8 %), (ii) Teaching aspect of the course (17.3 %), (iii) Interesting topics (9.2 %), (iv) Teacher factor (5.1 %) and (v) Contribution to the future job (2.0 %).

The students stated following reasons on Table 12 for not enjoying the science course.

Table 12. Reasons for not Enjoying Science

Themes	Gifteds' Opinions		Non-Gifteds' Opinions	
	N	%	N	%
It is boring	0	0	5	41.7
I do not love the teacher	0	0	4	33.3
It is difficult	0	0	2	16.7
It is not useful for daily life	0	0	1	8.3
It is based on memorization	1	100.0	0	0
Total	1	100.0	12	100.0

As can be seen in Table 12, the only reason that took gifted students away from science course was *memorization* (100.0 %). The main reason for non-gifted students for not enjoying science was the fact that the course was boring (41.7 %). Teacher factor (33.3 %), difficulty of the course (16.7 %), no daily life transfers (8.3 %) were the following reasons for them.

A number of students indicated that they did not completely enjoy science but they enjoyed science to a considerable degree. The findings related to their reasons were presented in Table 13.

Table 13. Reasons for Enjoying Science to a Considerable Degree

Themes	Gifteds' Opinions		Non-Gifteds' Opinions	
	N	%	N	%
It has difficult/easy topics	8	47.1	15	68.2
It has interesting/boring topics	7	41.2	7	31.8
I do not like the teacher much	2	11.8	0	0
Total	17	100.0	22	100.0

For both student groups, the difficulty of the course made them enjoy science to a considerable degree in the first place whereas it was followed by the type of the topics. Teacher factor came in the final place for the gifted students whereas it was not asserted by the non-gifted participants in the study.

DISCUSSION AND CONCLUSION

According to the study results, it can be concluded that gifted students are keener on science course than the non-gifted ones. Non-gifted students possess more negative interests than gifted. Another point is that female gifted students show more interest in science than males and non-gifted females. This situation contradicted what was reported by Miller, Blessing and Schwartz (2006) and Caleon and Subramaniam (2008) whose studies favored boys than girls. Also, females enjoy science more than males both among the gifted and non-gifted. There are no female gifted students who do not enjoy science. The result found from enjoyment of science was also consistent what was found for interest level towards science in terms of gender. Preschool education was not found to have much effect on gifted students' interest in science extremely for the present study. When the total of responses extremely and quite are evaluated together for those who received and not received preschool education, students who received preschool education have more positive interest towards science. This might be drawn out as a gain of preschool education for all learners – gifted or not.

Generally, there is a drop in students' interest as continuing grade levels. Early graders enjoy science more than in continuing grades. There may be several reasons for this situation. Elementary second level matches with puberty of students which may result changes in students' psychology. Also, the difficulty and concreteness of the topics, and coming high school entrance examination can be listed as other factors. The reasons of decreasing interest in science with increasing grade level can be another independent study topic to be discussed in detail. Vialle, Heaven and Ciarrochi (2007) indicate the need for researches related to the examination of the changes of developmental characteristics from youth to adulthood in a similar manner.

To avoid students' decreasing interest towards the science course with increasing grade levels, counseling services in schools should be more active by providing programs which intends to eliminate students' exam anxiety. In addition, teaching activities should always be related to daily life. This may capture students' interest more and supply high motivation towards the course.

The ratio of students who enjoy the science course is about the same in both gifted and non-gifted. Since they are taught in the same school, this result can be a gain of positive attraction among the students. In the literature, it is also possible to find out that it causes a positive effect on students' achievement when gifted and high ability students are educated together in the elementary and middle school years (Neber, Finsterwald & Urban, 2001). However, the percentages of students who do not enjoy science among the non-gifted and who enjoy science *to a c. d.* among the gifted have a higher ratio.

In the study, earlier graders were found to enjoy the science course more than the following grades. When the reports of National Education Ministry (2007) is examined, elementary second level students show a decline in enjoyment of science when passed from the 6th to 7th grade; and there is a rise when passed from the 7th to 8th grade. This finding is parallel to what has been found in this study for the non-gifted students. However, the situation is not the same for the gifted. There is a fall in gifted students' science enjoyment with increasing grade level. On the other hand, the percentage of gifted students who enjoyed science *to a c. d.* was found to increase with increasing grade level. Hence, necessary precautions should be considered by the educators and the government in order not to deceive those children. As indicated by Robinson (1997), the most successful gifted students should be treated as they are in risk of failure and provided with special education to meet their needs.

Again according to that report results, the percentage of Turkish students who enjoy that course slightly was found to increase when passed from the 6th to 7th grade and decrease from the 7th to 8th grade (MEB, 2007). This finding is consisted with what has found in this study for non-gifted students' reasons of enjoyment of science *to a c. d.* On the other hand, the ratio of the gifted students showed an increasing trend with increasing grade level for enjoyment of science *to a c. d*. In fact, this response can be due to the changeability of students' opinions and they should be remedied to the positive side. To improve the percentages gained from the study, it can be started from the solutions of the issues asserted by the students.

When the students' genders were considered, it can be concluded that male students are more uncertain about their opinions towards science course than female students since their *to a c. d.* responses are higher.

As can be seen, there are differences between gifted and non-gifted students' interest level and enjoyment trends in science. Although National Education Ministry Reports (2007) demonstrates similarities for the findings related to non-gifted or average students participated in the study; gifted students' situation is far more different. Hence, they should be educated considering those differences. Teacher training is another aspect of this issue not to be ignored (Coates, 2006).

Besides students' approaches, their related reasons should be considered by educators to improve education. According to the results of study, the most penetrating factor for enjoying the science course is the fact that it is joyful. This result is parallel to Çepni and Çoruhlu's (2010) findings. Another influential factor found in the present study is the fact that it is scientific as reported previously by Buluş Kırıkkaya (2010).

When suggested reasons were evaluated altogether, cognitive concerns are more frequent among the gifted students. To illustrate, the only reason suggested by the gifted students for not enjoying science is memorization. However, non-gifted students did not propose such a thing. Additionally, they insisted on the difficulty/easiness of the topics for enjoyment of science *to a c. d.* In a previous study it was found that Korean science teachers consider the cognitive aspect of creativity completely in gifted education and realize that there is a strong relationship between creativity and cognitive ability (Seo, Lee & Kim, 2005). However, they do not pay enough attention to the environmental and individual components of creativity (Seo, Lee & Kim, 2005). Gifted students' cognitive focuses found in the present study might be due to their teachers' such considerations. However, their potentials should face other areas as well. To enhance students' creativity, creative drama courses could be given as a must course in teacher training programs in education faculties despite giving as an elective course. For the teachers who are on duty, in service training could be given.

On the other hand, when the percentages of reasons are considered, the non-gifted seemed to assert more ideas related to that course in a more comprehensive range than the gifted. While gifted students tended to focus on cognitive aspects, non-gifted students' responses involved more affective approaches as well. The reasons which had about the same ratio in two student groups were the fact that *it was numerical* and *it is related to daily life*. Moreover, reasons such as *it is joyful, I love teacher, it is related to my future job* for enjoyment

of the course; *it has interesting/boring topics, I do not like teacher much* for enjoying science to a considerable degree and *it is boring, I do not love teacher, it is not valuable for daily life* for not enjoying science assert affective concerns of students. Yangın (2007) recommends investigating students' affective looks on courses from his study results. And affective concerns have higher percentages among the non-gifted.

Non-gifted students indicate that the course has boring topics in terms of enjoyment of science *to a c. d.* and not enjoying science reasons and add that it is not useful for daily life in terms of not enjoying science reasons. Gifted students also assert boring topics in terms of enjoyment of science *to a c. d.* reasons. Despite the fact that those students did not consider that issue totally as a negative thing, as suggested by Ocak and Ergin (2006) the course can be conducted with the help of activities which bridge it to daily life. This may help students change their views in a totally positive way.

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Appendix

Questions in the Research Instrument

1st Part

1. Name:
2. Gender: O Female O Male
3. Year of Birth:
4. Grade Level: O 4 O 5 O 6 O 7 O 8
5. Did you receive preschool education? O Yes O No

2nd Part

6. How interested are you in science course?
   O Extremely O Quite O Slightly O Scarcely O Not interested
7. Do you enjoy science course? O Yes O No O To a considerable degree
8. According to your response in question 7, please choose *one of the following items*:
   - **a.** If you select "yes"; what are your reasons?
   - **b.** If you select "no"; what are your reasons?
   - **c.** If you select "to a considerable degree"; what are your reasons?