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Research Article

Examination of Science and Technology Teachers' Attitude and Opinions Related Giftedness and Gifted Education in Turkey[1]

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Abstract

In this study, it is aimed to examine the Science and Technology teachers' attitude and views related giftedness and gifted education. This research used both qualitative and quantitative research designs, is a mixed pattern research. The study group of the research consists of 111 Science and Technology teachers in the academic year 2011-2012 in the province of A. These participants were applied Teacher Attitude Scale towards Gifted Education (TASGE) as collection of quantitative data. For obtaining qualitative data, semi-structured interview was used with four science and technology teachers. For the analysis of quantitative data, percentage, frequency, t-test and analysis of variance were used. The data obtained from the interview were subjected to content analysis. As a result, science and technology teachers' attitudes towards gifted education were found to be slightly above the undecided attitude. In addition, science and technology teachers stated that supportive education for gifted children in Science and Art Centers (SACs) was insufficient and they adequately could not cooperated with this institution.

Keywords

gifted education, science education, science curriculum, science and art centers

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Introduction

The aim of education in these times when the amount of information increases incrementally is not to simply give the information to students, but to make them understand, acknowledge and use when necessary. Some of the most important courses that apply this aim are science courses (Tatar & Kuru, 2006). Science courses include different disciplines (Physics, Chemistry & Biology) and acquisitions about these disciplines are given to students that are in degree of primary and secondary school in science and technology courses (MoNE, 2006, 2013). For that reason, the importance of science and technology in understanding and interpreting the world cannot be denied. Within the science and technology courses, students structure new information researching, reading and discussing. Students also learn how to predict the results of their acts thanks to these courses. Acquisitions like this prove the importance of science and technology courses (Tekbıyık, & Akdeniz, 2008). The scientific values that hold the basis of science lead the students to understand the science, to be interested in science and to approach to the problems like a scientist. It can be seen that until 2006, science and technology courses did not have these qualifications (MoNE, 2006). In 2006, aiming to create the capability of meeting the needs easily while also having a link to 4th and 5th grade science and technology courses, a new plan for 6th, 7th and 8th grade students was produced. While the course "Science Information" was renamed to "Science and Technology, weekly course hours were approved to be 4. The vision of the course was determined as: "*To educate all the students as a science and technology followers, no matter the personal differences.*"

Within the education programs prepared for secondary school students, it was tried to appeal to other student groups of different degrees. One of the groups that have a different intelligence capacity is gifted students (Ataman, 1998; MNoE, 2007; Sak, 2011, Tortop, 2015a). It shined out in the quick change through the information structuring process as an important detail in terms of meeting the needs of gifted people (Ataman, 1998). Because, gifted students show a higher degree of behavior than what they are expected to (Sak, 2011, Tortop, 2015a). When thought about the education needs of gifted students, it is quite important to prepare activities that match their level of intelligence (Tortop, 2015a). By taking this situation into consideration, gifted students must be educated according to their skills, with a programmed education plan, instead of being treated like "he/she already has the capacity, (s)he will somehow succeed." In our country, the education of gifted students is maintained in Science and Art Centers (SACs, is called BILSEM in Turkish). In our country in which the importance of gifted student education has been acknowledged recently, the BILSEM count giving this education raised from 18 (2003) to 58 by 2010. In its strategic plan, MoNE aimed to improve these 58 SACs and raise the number to 94 until the end of 2014 (IIRSAC, 2010).

Science and technology takes the first place among the courses that adds to students' improvement in a cognitive way (Tereci, Aydın & Orbay, 2008). Thanks to this course, students' sense of wonder develops and they become more interested in learning. Students that are more skilled in science and technology course than their coevals can create new products and carry this skill of theirs out of school, using the potential created by their interest in science and technology (Tekbıyık, & Akdeniz, 2008). For example, they can carry out experiments, creating a personal laboratory or they can follow magazines or books that are about science (Feldhusen, 1986). These situations prove that the science education of gifted students must be done in a serious manner. Hence, the attitude towards giftedness and gifted students of teachers that carry out the science and technology program in schools towards giftedness and gifted students is so important.

Method

In this study, it is aimed to find out the teachers' attitude and thoughts towards giftedness and gifted students' education. This study is a research that was carried out in a mixed pattern with both qualitative and quantitative research models (Yıldırım & Şimşek, 2008). The sub-problems of the research consist of the following questions:

- Does the attitude of science and technology teachers towards the gifted students' education change depending on the sex/seniority?
- What are science and technology teachers', students' and gifted students' opinions about the science education?

Participants

For the quantitative part of the research, working group consists of 111 science and technology teacher working in A city in which the research was done in 2011-2012 education season. This number makes up the 78% of science and technology teachers in the city. For the qualitative part of the research, the working group was chosen according to the snowball sampling method. In snowball sampling method, choosing the people that have the most knowledge on subject in question is aimed (Miles & Huberman, 1994; Yıldırım & Şimşek, 2008). In order to be able to evaluate the education activities in SAC in a perspective of a normal school teacher, normal school science and technology teacher of a gifted student who was having education in SAC was contacted. Other teachers were found by the first teacher's recommendations.

Table 1. Demographic characteristics of science and technology teachers

		F	%
Sex (*N*=111)	Male	60	54.05
	Female	51	45.94
Age (*N*=111)	20-25	23	20.7
	26-30	39	35.1
	31-35	22	19.8
	36-40	12	10.8
	41-45	3	2.7
	46-50	2	1.8
	51 +	10	9
Seniority (*N*=111)	1-5 Year(s)	47	42.3
	6-10 Years	29	26.1
	11-15 Years	11	9.9
	16-20 Years	11	9.9
	21-25 Years	3	2.7
	26-30 Years	0	0
	30 + Years	10	9
GraduationType (*N*=111)	Training Institute	4	3.6
	Faculty of Education	106	95.5
	Master'sDegree	1	0.9
School Type (*N*=111)	Public School	106	95.5
	Private School	5	4.5

As seen in the Graph 1, when analyzed in terms of demographic characteristics of the teachers, it was confirmed that the number of the male teachers were 60 (54%), while the number of the female teachers was 51 (45%). 55% of the teachers were 20-30 years old, 30% of the teachers were 31-40 years old and 13% of the teachers were 41+ years old. Graduation type was also mostly Faculty of Education. 95,5% of the teachers worked for public schools, while only 4,5% of them worked for private schools.

Data Tools

Attitude Scale towards Gifted Education (ASGE). Developed by Gagné & Nadeau (1985) for the first time and consisting of 34 clauses originally, this Attitude Scale "Opinions about the Gifted and Their Education" (ASOGTE) was prepared in a five point likert scale. ASOGTE's original state which consisted of 34 items was used in this study. In ASOGTE, Gagné (1995) talked about six sub-dimensions. He examined *Need and Support Dimension (ND*) as gifted children and support needs for

private services, *Ability Grouping Dimension (AGD)* as attitudes towards homogenous groups, classes and schools, *Resistance and Objection Dimension (ROD)* as objections relying on ideology and priorities, *Rejection Dimension (RD)* as skilled people's exclusion from their close community by others, *Social Value Dimension (SVD)* as social benefits of having gifted people in society and *School Acceleration Dimension (SAD)* as the attitude towards the acceleration and enrichment programs.

ASOGTE's adaptation study was carried out by Tortop (2012a). This scale Turkish version, Attitude Scale towards Gifted Education (TASGE) has been called. The adaptation study was done in order to test the validity and reliability of the scale in Turkey, and it was found that the scale's Cronbach α coefficient of internal consistency is 0.69. The adaptation study was conducted with the participation of 347 students working in primary schools located in Zonguldak and Isparta, in 2011-2012 educational season. The data was gathered using *"Personal Information Form"* and *"Attitude Scale towards Gifted Education" (TASGE)*. Language, content and structure validity was analyzed according to ASOGTE validity. Help from 3 specialists about gifted education received for content validity.

Interview Protocol. An interview protocol consisting of semi-structured question was prepared. One of the questions is *"What do you know about the gifted students in your school and their educational needs?"* The interview was held with four different teachers and it was reported with the analysis of given answers.

Data Analysis

In the analysis of quantitative data, the program SPSS was used. t-Test, frequency, percentage and variance analyzes was used while analyzing the data. Confidence interval was determined as 0.05. Results that shows significant differences in the graphs which quantitative data are transferred to were marked with " * " symbol. The interviews that form the qualitative data were put to content analysis. With the obtained results of content analysis, themes and sub-themes were created. In themes and sub-themes, direct quotes from teachers involved in the study were presented. Teachers involved in the study were coded according to their sex and ages (e.g.: teacher A – male – 36).

Results

In this section of the study, obtained from the data gathering tools, the data about the attitude and thoughts of the science and technology teachers on gifted education were presented and commented.

Quantitative Results of the Research

In Table 2, the attitude scores of science and technology teachers towards gifted education and mean attitude scores of TASGE and its sub-dimensions scores were given.

Table 2. The mean attitude scores of science and technology teacher participants towards gifted education

	N	Min.	Max.	Mean	Std.Deviation
TASGE mean attitude scores	111	2,59	3,94	3,37	0,29
NSD mean attitude scores	111	2,63	5,00	3,96	0,49
ROD mean attitude scores	111	2,00	4,25	3,29	0,55
SVD mean attitude scores	111	1,00	5,00	3,53	0,73
RD mean attitude scores	111	1,80	4,40	3,13	0,57
AGD mean attitude scores	111	1,90	4,20	3,23	0,44
SAD mean attitude scores	111	1,00	4,33	2,50	0,78

NSD: Need and Support Dimension, **ROD**: Resistance and Objection Dimension, **SVD**: Social Value Dimension, **RD**: Rejection Dimension **AGD**: Ability Grouping Dimension, **SAD**: School Acceleration Dimension.

Gagné (1995) stated in his study named *Attitude Scale "Opinions about the Gifted and Their Education" (ASOGTE)* that $\bar{X}$=4.00 and above mean scores are positive, while also stating what is below $\bar{X}$=2.00 is very negative. The means between $\bar{X}$=2.75 and $\bar{X}$=3.25 can be interpreted as uncertain. Based on these, mean attitude scores of science and technology teachers towards gifted education was detected as $\bar{X}$=3.37. If we take Gagné's scale above into consideration, we can say that the attitude of science and technology teachers towards gifted education is a little above "uncertain".

It was seen that the highest score from the TASGE sub-dimensions came from Need and Support Dimension ($\bar{X}$=3.96). We can say that the attitude of the teachers towards this dimension has the highest score. The lowest score of TASGE sub-dimensions was the score of School Acceleration Dimension ($\bar{X}$=2.50).

In Table 3, the attitude of science and technology teachers towards gifted education scale and gender-detailed t-test results of the mean scores for the scale's sub-dimensions were given.

Table 3. TASGE and sub-dimensions scores T-test results according to gender

	Gender	N	Mean	S	Sd.	t	p
TASGE mean attitude scores	Male	60	3.304	.325	109	-2.604	0.010*
	Female	51	3.448	.240			
NSD mean attitude scores	Male	60	3.837	.530	109	-3.017	0.003*
	Female	51	4.112	.411			
ROD mean attitude scores	Male	60	3.245	.609	109	-1.053	0.294
	Female	51	3.357	.490			
SVD mean attitude scores	Male	60	3.433	.810	109	-1.565	0.12
	Female	51	3.652	.630			
RD mean attitude scores	Male	60	3.103	.596	109	-0.663	0.509
	Female	51	3.176	.558			
AGD mean attitude scores	Male	60	3.233	.458	109	-0.046	0.963
	Female	51	3,237	.428			
SAD mean attitude scores	Male	60	2.361	.764	109	-2.171	0.032*
	Female	51	2,679	.777			

NSD: Need and Support Dimension, **ROD**: Resistance and Objection Dimension, **SVD**: Social Value Dimension, **RD**: Rejection Dimension **AGD**: Ability Grouping Dimension, **SAD**: School Acceleration Dimension.

When we examine Table 3, we can see that the attitude scores of science and technology teachers towards the gifted education differs depending on gender ($t_{(109)}$=-2.60, p<.05). Female science and technology teachers attitudes ($\bar{X}$=3.48) are more positive in scores, compared to male science and technology teachers attitudes ($\bar{X}$=3.30). Also, it can be said that there is a significant difference between TASGE's sub-dimensions NSD ($t_{(109)}$=-3.01, p<.05) and SAD($t_{(109)}$=-2.17, p<.05) attitudes and gender. There weren't seen any gender-related differences between other sub-dimensions statically.

The change in the attitudes of science and technology teachers depending on their seniority is examined in the below Table 4.

Table 4. The ANOVA results of mean attitude scores of science and technology teachers according to their seniority

		Sum of Square	df	Mean Square	F	p
TASGE Mean Attitude Scores	Between Groups	0.176	5	3.52E-02	0.387	0.857
	Within groups	9.541	105	9.09E-02		
NSD mean attitude scores	Between Groups	0.62	5	0,124	0,492	0.782
	Within groups	26.486	105	0.252		
	Total	27.106	110			
ROD mean attitude scores	Between Groups	1.051	5	0.21	0.663	0.652
	Within groups	33.264	105	0.317		
	Total	34.314	110			
SVD mean attitude scores	Between Groups	1.123	5	0.225	0.401	0.847
	Within groups	58.813	105	0.56		
	Total	59.936	110			
RD mean attitude scores	Between Groups	1.773	5	0.355	1.065	0.384
	Within groups	34.946	105	0.333		
	Total	36.719	110			
AGD mean attitude scores	Between Groups	2.931	5	0.586	3.306	0.008*
	Within groups	18.622	105	0.177		
	Total	21.553	110			
SAD mean attitude scores	Between Groups	15.281	5	3.056	6.143	.000*
	Within groups	52.24	105	0.498		
	Total	67.522	110			

NSD: Need and Support Dimension, **ROD**: Resistance and Objection Dimension, **SVD**: Social Value Dimension, **RD**: Rejection Dimension **AGD**: Ability Grouping Dimension, **SAD**: School Acceleration Dimension.

If we examine Table 4, we can see a significant difference in the attitude of science and technology teachers towards gifted education in terms of TASGE dimensions School Acceleration Dimension and Ability Grouping Dimension. ($F_{(5-105)}$=6.143, p<.05; $F_{(5-105)}$=3.306, p<.05).

Qualitative Results of the Research

Four themes acquired from the analysis of the content obtained from the qualitative data and codes creating the themes were given below.

Table 5. Theme and sub-themes resulted from content analysis

Theme 1: Gifted Education in Schools
Sub-theme 1: Gifted Students' Qualification
Sub-theme 2: Importance of the Gifted Education
Sub-theme 3: Teachers' Proficiency on Gifted Education
Sub-theme 4: The Necessity of the Gifted Education
Sub-theme 5: Grouping The Gifted Students
Sub-theme 6: Proficiency of Schools in terms of Gifted Education
Theme 2: Needs of Gifted Students within Science and Technology Courses
Sub-theme 1: Project Work
Sub-theme 2: Proficiency of SACs in terms of Education Support
Theme 3: Aspect of Science and Technology Curriculum in terms of Gifted Education
Sub-theme 1: Meeting Gifted Education Needs
Sub-theme 2: Science and Technology Curriculum and Gifted Education
Theme 4: Cooperation between Schools and SACs
Sub-theme 1: Necessity of Cooperation
Sub-theme 2: The State of Cooperating
Sub-theme 3: SACs Teacher Proficiency

Theme 1: Gifted Education in Schools

Gifted Students' Qualification. Explanation of the qualifications that gifted students normally have in cognitive ways was made.

> *"They are energetic students that always examine, making you feel they are different than others…" (Teacher A)*
>
> *"I know their points of view on events are different from other students, their will to learn is better and their skills are more advanced…" (Teacher B)*
>
> *"They want more, compared to the other kids. When you cannot give them enough they are trying to disrupt the course, they want to do different things" and "Their IQ is really high and they canalize their thoughts and behaviors into a different thing." (Teacher C)*

> *"Children that can see some experiments you do in the class in a different aspect are, I believe, gifted. I mean the children thinking about the things that no other one thinks and asks questions about the different aspects of the experiments you do in class…" (Teacher D)*

The Importance of the Gifted Education. The comments of science and technology teachers involved in the research indicate that gifted education is important.

> *"Of course it is important, maybe the most important, actually. We have to encourage them…" (Teacher A)*
>
> *"If he/she is gifted, I believe he/she can give better products in this subject which are in favor of society…" (Teacher B)*
>
> *"For example they are seen scientists of the future, the saviors of Turkey. It is same in both here in Turkey and the entire world…" (Teacher C)*
>
> *"I think they are called science and art centers. But I think, maybe because of the situation we're in as a country, we cannot really any efficiency…" (Teacher D)*

Teacher Proficiency on the Gifted Education. In this theme teachers talked about the qualifications that teachers working in schools should have for gifted students. When needs of the gifted students taken into consideration, teachers believe that teachers guiding these students should have some special qualifications even though they are not gifted. Another result about this subject is also that teachers claim they are not proficient for gifted education.

> *"I mean, I know we are not in a position to appeal to them in schools…" (Teacher A)*
>
> *"Because science and technology teachers don't have an education like that, they are not capable of handling such a task. At least, this is the truth for me…" (Teacher B)*
>
> *"The teachers educating the gifted have to be better even though they are not gifted themselves, I think…" (Teacher C)*

The Necessity of the Gifted Education. All teachers involved in the research stated that the gifted education is a must.

> *"It is necessary but this should not be an education carried out with normal students. They should be educated in different classes but in the same schools while also avoiding hurting other students…" (Teacher A)*
>
> *"I think it is indeed necessary…" (Teacher B)*

> *"I think it is necessary. But it should be done in a way to avoid brain drain. The courses for them must include love of country and nation and also improve the skills and knowledge they have…" (Teacher C)*
>
> *"It is definitely necessary. This education must be given for sure. At earlier ages, perhaps…" (Teacher D)*

Grouping the Gifted Students. Teachers stating the gifted education is necessary also said that this education that is to be given to these students must be carried in different classes on different times from school time.

> *"I think it is okay for this education to be in different classes but I do not approve a different treatment to the gifted if they are in the same class with the others…" (Teacher A)*
>
> *"I believe in the necessity of a place or an institution in which these students could improve themselves…" (Teacher B)*
>
> *"I think there should be a special education for them. They should be identified and given a special treatment in terms of education…"*

Proficiency of Schools in terms of the Gifted Education. About the proficiency of schools in terms of gifted education, teachers generally gave negative answers. Science and technology laboratories of schools in the cities that the research was conducted in were stated to meet mean standards. Teachers, who are aware that the needs of the gifted students are different than others, showed resembling ideas on the lack of qualification of their schools.

> *"But I don't think schools are also qualified enough for them…" (Teacher C)*

Theme 2: Needs of Gifted Students within Science and Technology Courses

Project Works. It is claimed that gifted students' never-ending sense of wonder often consumed the teachers' energy within the class. All teachers involved in this research claimed these students are always more successful in project works. Hence, that these students generally take part in project competitions was also stated.

> *"I mean, we must encourage them. Only in national education schools, there is this "This is My Work" project competition, for example…" (Teacher A)*
>
> *"To support them we have make them do some experiments ourselves. And we also have to make them feel the laboratory. For example, I have a couple of them in my class. I cannot make them stop for a second. You have to give them something to do and science teachers are just the match for this." (Teacher C)*

> *"There might be students that find solutions in a much different way. For example "This is My Work" project is so helpful in that it helps us to discover the students in new ways…" (Teacher D)*

Proficiency of SaCss in terms of Educational Support. About the operation and student picking methods of SaCs in the city in question, teachers claimed their negative opinions. Only one of the teachers claims SaCs are proficient and necessary.

> *"Take computer laboratories for example. They can be used; there is no need to go to SaCs. Schools could be used" and "That's okay for once or maybe twice, but after that, students start to get bored. Instead of going to SaCs, they can do that in schools. Projects and all that kind of stuff are held in schools…" (Teacher C)*

Theme 3: Aspect of Science and Technology Curriculum in terms of the Gifted Education

Meeting Gifted Education Needs. It was seen that the opinions of science and technology teachers involved in the research about science and technology courses were negative. Complaining about the intensity of the course program, teachers implied that some of the activities in their course books were easy. Especially, about the fact that gifted students get bored during these activities and tend to disrupt the class was implied by four teachers.

> *"I wish there were experiments after each subject. Experiments, which allow the students to create some things… And, with some visuality these would be great… But now it is insufficient…" (Teacher A)*

> *"If children have something in their minds they should be able to solve it, find answers for it by coming here. And teachers should be proficient for that as well…" (Teacher B)*

> *"No, science and technology course program is a big thing with so many parts each of which was taken from some other place. It is consisted of eight units and these eight units is a mixture consisting of dozens of subjects." (Teacher C)*

> *"Let alone the gifted, it is not even meeting the needs of normal students. In sixth grade subject are too easy. When promoted to seventh, you see there are too many subjects… We are not trying to make children love science; we are making them hate it…" (Teacher C)*

> *"I think students should easily get involved in projects and in these projects, students' approach must be categorized…" (Teacher D)*

Science and Technology Curriculum and Gifted Education. Because science and technology teachers involved in the research generally disagreed with the idea

of gifted education taking place in school time, they defended the idea that acquisitions that directly interest the gifted should not be involved in the program.

> *"I think it is not even meeting the needs of normal students. They should meet the gifted students' needs at least. Because in courses they find the activities easy…" (Teacher B)*
>
> *"The current program is not proficient for them…" (Teacher C)*
>
> *"It has to be improved. I don't think it is so bad but they should improve it. I don't believe it's not proficient in that gifted students could discover their skills…"(Teacher D)*

Theme 4: Cooperation between Schools and SACs

The Necessity of Cooperation. SACs importance in gifted education is acknowledged by the teachers working in schools. For this reason, all of the teachers involved in the research implied that the cooperation with the teachers in SACs is necessary in order to be able to meet the needs of the gifted better.

> *"For example in my school, the number of these students wouldn't pass 10. For these 10 students I believe we have to be in contact with the teachers of SACs." (Teacher A)*
>
> *"I can say that even in student sharing of "This is My Work" project, we experience "my school – your school" objections. In such project there has to be cooperation." (Teacher B)*
>
> *"I know it is a cliché but there should be a good laboratory." (Teacher C)*
>
> *"I think subjects that the children are not interested in are pushed to children. I mean, just because they are gifted doesn't mean you can push anything to them. You have to appeal to them. Every student will have another point of interest. Some would be interested in biology while some in chemistry. You have to categorize them according to their interests." (Teacher D)*

The Situation of Cooperating. Science and technology teachers involved in said that they did not cooperate with SACs so often because they did not think there were serious projects in which they could cooperate.

> *"Because we don't know how things work in SACs we don't know what state they are in. What could be done in order to make them more active? Again, there has to be communication between the two…" (Teacher A)*
>
> *"I am not in cooperation with the teachers in science and art centers. I heard they left some tests when they came here, but we have never cooperated in a work…" (Teacher B)*

> *"I have never cooperated with them, and that is my mistake. But I talked to them in past. They are assigned teachers just like us. I talked to the student as well, but I don't believe it is necessary. There is some benefit of course, at least they pick students, but it happens in a random way…" (Teacher C)*

> *"I talked to some students who are going there but there were even some students that do not want to go. I believe if the student doesn't want to go there, that means they cannot meet his/her needs…" (Teacher D)*

SACs Teachers' Proficiency. Teachers involved in the research think that teachers working in SACs are not proficient.

> *"Personnel of these institutions are just not proficient. They cannot meet the needs of students." (Teacher B)*

> *"Teachers there lack the knowledge about themselves in the first place. And I can say they have communication problems with students." (Teacher B)*

> *"I think they cannot do their parts. I investigated a little bit, and I see it is just like how every teacher in primary schools encourages the students to work on, to be interested in their branch…"(Teacher C)*

> *"I don't think they are so proficient in terms of science and technology. The number of courses could be increased. And students should approach in a more serious way. "(Teacher D)*

Conclusion and Discussion

According to the results obtained from this study which aimed to find out the opinions of science and technology teachers on gifted education, we can say the following. The attitudes of the science and technology teachers working for the schools which are in the city that the research took place are just above uncertain. In Tortop & Kunt (2013a), attitude scores of primary school teachers were examined according to TASGE and it was found that the lowest score was for science and technology teachers. Although it has been so many years since the studies on gifted education started to be done and institutions like SACs began operating in our country, it is troubling to see that the attitudes of the science and technology teachers of the city in which the research took place are just above uncertain. This situation might mean that in our society, in our teacher training policy we do not have a clear stance against gifted education (Tortop, 2014a, 2014b). While the situation is like this in our country, in developed countries such as Holland, according to a study (Hoogeveen, Hell & Verhoeven, 2005), most of the teachers recommended a special approach towards gifted education and claimed program acceleration as a beneficial practice.

We can see there is a significant difference in attitudes of science and technology teachers involved in the research in terms of TASGE sub-dimensions, School Acceleration Dimension and Ability Grouping Dimension. That is, teachers involved in the research showed a negative attitude against promoting the gifted. Various practices (radical acceleration, schedule enrichment and reduction, promotion, early access to universities etc.) about gifted education are applied in countries such as Australia, China, Poland and the US (Tortop, 2012b). It is an interesting situation to see the negative thoughts of the science and technology teachers involved in the research, on gifted promotion, while this practice is applied in many countries. Science and technology teachers stated they did not feel themselves proficient for gifted education. All of the teachers involved in the research claimed that they did not know how to react to the needs of the gifted in school. It is crystal clear that science and technology teachers and other teachers need an in-service training on giftedness and gifted education (Tortop, 2014).

Science and technology teachers stated that the SAC in the city of research did not have enough qualifications. They implied the education support in these institutions is not enough and displeasure of gifted students on these institutions is seen. In these institutions, students could be made interested on subject and willing to learn with the help of field trips arranged depending on the needs of the gifted. (Yavuz & Tortop, 2009; Tortop, 2012c; Kunt & Tortop, 2013)

All of the teachers involved in the interview part of the study claimed opposite ideas on gifted students being educated in a different way in normal schools. However, according to Tekbaş (2004), gifted students can have education in mixture with others and that would benefit both the gifted students and his/her classmates. As the research suggests, science and technology teachers think it is better for the gifted students to have a special education with other gifted students in their schools, without needing another place and apart from school time.

One thing that can also be concluded from the results of the research is that no cooperation is done between the science and technology teachers working in schools and teachers working in s. Science and technology teachers working in normal schools stated that they almost never see the teachers working in SACs except for the time when they come to detect gifted students in the openings of the educational seasons. Similarly, Sezginsoy (2007) also stated that there was no cooperation between the two. Also, it is reported that schools are not informed about how SACs operate. It is interesting to see there is no cooperation with SACs, even though all the teachers claim that gifted students need an educational support. This situation raises a question on the proficiency of SACs and the personnel working in these institutions. It is an unavoidable fact that teachers educating the gifted should meet

specific qualifications. The fact that teachers do not get efficient in-service training on giftedness and gifted education, and that they do not know how to approach to the gifted students and the ways of educating them for that reason is something that could be concluded (Sezginsoy, 2007; Sak 2008, 2011; IISARC, 2010; Tortop, 2014c).

One of the results the research has revealed is that there is need for a special program that could meet the needs of the gifted students. However, the science and technology course program that has started to be used by 2006 was prepared taking the needs of the gifted students, who were having trouble in learning, into consideration (Tekbıyık & Akdeniz, 2008). Teachers, who also claim the program is not even appealing to a normal student, criticize the SAC in the city in which the research took place in terms of teacher proficiency, operation and physical conditions in a negative way.

Science and technology teachers involved in the research have shown an attitude close to uncertain. To change the attitudes of science and technology teachers on gifted education to positive, they must be trained well in terms of gifted students and their needs and get encouraged on gifted education (Tortop, 2014c).

In order to make the teachers able to include activities that would meet the needs of the gifted in science and technology courses, in-service trainings and seminars should be organized by professionals (Tortop ,2014c)..

The communication between SACs and formal schools should be improved. This will provide gifted education with important contributions. Any improvements in the awareness and knowledge of science and technology teachers, who plays a crucial role in education of the academically gifted students, would definitely affect the quality of the education they give in a positive manner. Also, in-service trainings in which this teacher group could learn how to apply the modern ways of gifted education must be organized immediately.

New education programs such as Program for the Gifted Students' Bridge with University (EPGBU) (Tortop, 2013, 2015b) for academically gifted students should be implemented in Turkey.

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