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Research Article

Investigation of attitudes and self-efficacy of mathematics teachers towards gifted education

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Abstract

Some of the problems in the education of gifted students are based on the qualifications of the teachers. Teachers' attitudes and perceptions towards gifted students have a significant impact on the education to be provided to gifted students. It is thought that it is important to determine the general attitudes and perceptions of teachers and to provide required information to teachers in order to achieve the purpose of gifted education. In this study, it is aimed to determine the attitudes and self-efficacy of mathematics teachers towards gifted education within the scope of basic education and/or gifted education. In the study, the survey method was used to determine the relationships between two or more variables. The sample of the study consists of mathematics teachers working in Niğde province. In this study, the attitudes and self-efficacy of elementary and high school mathematics teachers towards giftedness and gifted education were tried to be relationally revealed. The data collection tools of the study were ASGE-the attitude scale for gifted education- (Tortop, 2014a) and GESST- the gifted education self-efficacy scale for teachers (Tortop, 2014b). As a result of the research, it was revealed that there was no expected relationship between attitude and self-efficacy, but the expected relationship was seen in the sub-dimensions of both scales. It was concluded that teachers with high attitudes towards gifted education showed a high tendency to create gifted classes. It was concluded that teachers with high academic qualification had similar levels of mentoring qualification, personal traits and instructional planning qualification. It was concluded that teachers' attitudes and self-efficacy towards creating special ability classes according to the needs of gifted students had a moderate relationship. It was concluded that teachers mostly agree on supporting the needs of gifted students with special services where as they generally do not support the idea of creating special ability classes according to the needs of gifted students. Moreover, teachers' attitudes do not change according to their personal traits and their attitudes towards the needs and support of gifted students are less related to their creativity. Analysis reveals that there is no significant difference was found according to age of the participants; however, regression analysis revealed that the 46-50 age group was a predictor of creating gifted classrooms.

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Introduction

In the historical development of societies, it is known that there are gifted individuals with leadership and productivity skills among the people who direct the society (Uzun, 2004: 24). In the history of the education, Enderun School in the Ottoman Empire was the first educational institution in the world in terms of its scope, systematicity and planning (Enç, 2005). Later in the 19th century, the concept of giftedness turned into a scientific concept and there were changes in the definitions of this concept over time. The term of "giftedness" has become an expression often used for people who are

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thought to have an extraordinary ability (Taber, 2017). Ministry of National Education (2012) defined gifted individuals as students who with an IQ score of 130 and above; as determined by experts and who perform at a high level compared to their peers. When the definitions in the literature are examined, Dağlıoğlu and Suveren (2013) stated that talent includes intelligence, therefore these definitions can be expressed with a single term under the term "giftedness", but there may be various definitions.

Gifted children, who have a rich vocabulary, advanced verbal skills, fluency, extraordinary thinking, leadership capacity, creativity and high-level problem-solving skills compared to their peers, have been important for societies throughout history (Davaslıgil, 2004; Sak, 2011a). It is considered quite essential today to bring the talents of all individuals to the best level. This understanding of education has made the education of gifted individuals more important. Giftedness is generally defined for students in three groups. These groups are classified as those who have talent in areas such as sports, music, and art; those who have an academic ability, and those who have versatile talents (Taber, 2017). It is aimed to develop these skill areas in institutions where gifted individuals receive special education.

There are two opposing views of teachers for gifted students: the congruence hypothesis and the dissonance hypothesis. The congruence hypothesis states that gifted students are superior in all areas, including social and academic life (Mottus et al., 2008; Persson, 1998). On the other hand, the dissonance hypothesis states that high ability has a cost and is associated with some negative traits such as social and emotional deficits (Neihart & Yeo, 2018). This shows that living with the gifted and providing education to these people includes difficulties as well as conveniences.

Ataman (2003) stated that education programs prepared for students with normal development are not suitable for gifted students, they get bored at school and lose their motivation because they learn fast. In order for gifted individuals to receive education appropriate to their abilities, it is significant to identify, recognise their giftedness and educate them in accordance with their abilities (Hong et al., 2011; Katerina et al., 2010; Siegle, 2001). In the identification of gifted individuals at an early age, diagnostic criteria, including nominations by teachers, are widely used (Clark, 2013; Sak, 2011b). Kaya (2015) stated that the approach that teachers have or adopt about the concept of giftedness will affect their presentation of programmes, materials and identification of gifted students. It is very important for teachers to have sufficient knowledge about gifted individuals, for these individuals to be identified and to receive a more qualified education. In this respect, determining teachers' attitudes and perceptions about giftedness has an important place in terms of education quality and efficiency of gifted education.

Gifted individuals need special education. When the needs of children in need of special education are not fulfilled, inequality, which is seen as a problem in the sociology of education (Doğan. 1998:53), emerges. The education of the gifted is also an important step towards providing equal opportunities in education (Ministry of Education, 1991:15). Since 1993, the General Directorate of Special Education Guidance and Counseling Services under the Ministry of National Education has been carrying out various studies for the education of gifted individuals in Turkiye. In the institutions opened under the name of Science and Art Center, it is aimed to identify and develop mental activity abilities and capacities of students with superior intelligence and talent at a young age, to ensure that they are aware of their characteristics, and to enable them to use their skills at a high level by developing their capacities (Ministry of Education, 2013). Science and Art Centers were first opened in Ankara in 1995 and served out-of-school with the program prepared for gifted students. Over time, by spreading these institutions throughout the country, more students were reached.

In order to increase the quality of education of gifted students, there are various approaches in the training of teachers in countries around the world. In some countries, these trainings are given during undergraduate education, while in some countries they are given after undergraduate education. In some countries, it is seen that such training is not provided. In countries such as Portugal, Spain, France and Italy, there are not any programs for the training of teachers of gifted students (Şahin, 2015). In our country, it is seen that there are a small number of "Gifted Education Teaching" programs in teacher training programs in universities and there are courses required for gifted education in the undergraduate programs in a small number of education faculties.

Attitude, self-efficacy concepts and their importance for teachers

Attitude is the individual's tendency to react to the object, subject or event in his or her environment. In this tendency, the person's knowledge, emotions and motivation are very important. İnceoğlu (2011) stated that attitude consists of "cognitive, affective and behavioral" dimensions. These dimensions are consistent among themselves. Arkonaç (2016) emphasizes that attitude is an evaluation of attitude objects. In addition, it states that attitudes can be at personal, interpersonal and intergroup levels and that attitudes affect intention and intention affects behavior. Considering the impact of attitudes on behavior; Attitudes are very important in an individual's perspective on any issue (Sevim & Kaya, 2023). The attitudes of teachers towards the supervision process in schools is an issue that should be taken into consideration in terms of the functionality of the supervision system and the feedback to the supervision system. In this respect, this research examined teacher attitudes towards the education of gifted individuals.

The concept of self-efficacy appears as one of the important factors affecting the capacity and success potential of the human phenomenon, which plays a role in many technical and social systems both in business life and social life. The foundation of the concept of self-efficacy, which has been the subject of many studies over time, was first laid by Bandura in 1977. Bandura (1986) defined the concept of self-efficacy as a person's judgment regarding his or her capacity to organize and carry out the activities necessary to demonstrate the targeted performance. In addition, (Yıldız, 2015) stated that it is a concept closely related to various skills such as the individual's motivation to take action towards achieving the task or goal, determination to progress, and the power to resist the obstacles he encounters. The concept of self-efficacy refers to the person's belief in these skills rather than expressing the state of being competent in skills. The use of the concept of self-efficacy over time has meant that the important thing in this concept is closely related to the belief in being able to perform this action (Çapri and Kan, 2007). Considering these definitions of the concept of self-efficacy, it is thought that teachers' self-efficacy regarding the education of gifted individuals is an issue that should be taken into consideration. In this respect, this research examined teacher attitudes towards the education of gifted individuals.

Importance of research

In the education to be offered to the gifted, the qualifications that teachers should have are of great importance. Teachers' personal characteristics and professional competences are exceedingly effective in the development process of gifted students. This is because teachers affect students' academic, cognitive and affective development (Ford & Trotman, 2001). Teachers' attitudes towards gifted students and their perceptions about these students also affect the education to be provided to gifted students. In order for the education offered to the gifted students to achieve its purpose, it is necessary to determine the general attitudes and perceptions of teachers and to provide the required information to teachers.

Teachers' attitudes towards gifted students represent their implicit views about gifted students, which in turn affect their behaviors towards them (Akgül, 2021). Şahin (2015) lists some of the characteristics that teachers who teach gifted students should have as being interested in new developments in education, being motivated by student learning, being a patient listener, having a broad general culture, having good academic success in student life, having systematic and programmed study habits. being open to criticism, being able to cooperate with other experts and not being judgmental, being able to create a sense of trust in students, having democratic attitudes, thinking flexibly and being tolerant. Teachers' attitudes and perceptions towards gifted students are an important factor in their endeavours to have these characteristics.

Among the components of the phenomenon investigated in this study; there are many studies on the attitude towards the education of gifted students. There is an extensive literature on teachers' attitudes towards the education of their gifted students. There is inconsistency in the literature regarding these attitudes of teachers. While some individuals are positive about the education of gifted people (Erdogan, 2017; Jurisevi & Zerak, 2019; Krijan & Boric, 2015). On the other hand, it is reported that some biological reproductions have negative attitudes (Allottey, 2020; Nyarko et al., 2017) or indecision (Kunt and Tortop, 2017; Tortop and Kunt, 2013) towards the education of gifted people. While in some cases it has been reported that there are contrary situations (Lassig, 2003), in some cases the contrary has not been reported (Tortop & Kunt, 2013).

Studies on the other component of the study, self-efficacy towards gifted education, have also contributed to the field. Although there are few studies evaluating teachers' self-efficacy towards gifted students, Dinçer (2019) found that self-efficacy was slightly higher. This study found no significant gender differences in self-efficacy; However, other differences in age and gender were also noted among participants on some subscales. The results of previous studies (Dinçer, 2019) suggest that improving teachers' self-efficacy can be effective on teaching gifted students.

However, any study conducted with mathematics teachers examining the relationship between the attitude towards the education of the gifted and their self-efficacy regarding the education of the gifted has not been encoutered. In this respect, it is thought that the current study will contribute to the field in terms of trying to reveal whether there is a relationship between the attitude towards the gifted education and self-efficacy towards gifted education. In addition, it is thought that this study is of great importance in the mathematics education of gifted students.

The first thesis in the field of mathematics education of gifted students was published in 2002, and it has been found that approximately 42 master's and 23 doctoral theses have been completed to date (Kirişçi, 2023). A large proportion of the theses completed are master's theses. According to the studies of Sak et al. (2015), the doctoral theses examined are approximately one quarter of the master's theses. In addition, 66 articles in the field of mathematics education have been identified in national and international journals publishing in the field of gifted children and education since 2000, 51 of which were published in international and 15 in national journals (Demirci & Tertemiz, 2022). There are a total of 4 articles in international journals examining the attitudes and approaches of teachers and parents of gifted students towards being talented in mathematics and towards mathematics lessons (Demirci & Tertemiz, 2022). In international studies, it has been observed that technology is a frequent subject of research for gifted students, both in mathematics education and in other fields (Duda et al., 2010; Periathiruvadi & Rinn, 2012). When these studies conducted in the field of mathematics education of gifted students were examined, no studies were found that determined the attitudes and self-efficacy of mathematics teachers towards the education of gifted students.

Teachers play a critical role in the mathematics education of specially talented students, both in terms of academic development and in their social-emotional development. The roles of teachers of students with special talents in mathematics from pre-school to secondary education may also differ within themselves. The ability to fully fulfill all these roles is directly related to the competencies of teachers of students with special talents in mathematics (Croft, 2003). Research on teachers of gifted students shows that teachers are mostly inadequate in preparing and implementing activities (Cengizhan, 2019; Girgin, 2020) and creating individualized education plans for gifted students (Bedur et al., 2015; Serin & Korkmaz, 2014) and that they need training. shows what they heard. In addition, it has been determined that in-service trainings focusing on gifted students enable teachers to be aware of the individual abilities and characteristics of gifted students (Erişen et al., 2015; Kazu & Şenol, 2012). In this regard, determining the attitudes and self-efficacy of mathematics teachers towards the education of gifted children has an important place.

Purpose of the Study

Gifted students should be given the opportunity to transform their current potential into performance through training appropriate to their abilities (Saltık Ayhanöz, 2022). One of the most serious problems in the education of gifted students is the qualifications of the teachers who will teach them. Teachers of gifted students should be more talented and more imaginative than other teachers (Lewis, 1982). In order to make a proper diagnosis of gifted students, it is very important that classroom teachers have a positive attitude as well as having sufficient knowledge about "gifted students" (Tortop & Kunt, 2012). The approach and philosophical perspective of teachers towards different children and their education is quite influental, because the teacher's view of education has a great impact on teaching approaches (Dağlı, 2014). In this research, it is aimed to reveal the attitudes and self-efficacy of mathematics teachers towards the education of gifted students within the scope of basic education and/or special education. The problem of the study;

- What is the level of mathematics teachers' attitudes towards gifted education and their self-efficacy towards gifted education?
- Do the attitudes of mathematics teachers towards the education of gifted students differ according to gender?

- What is the relationship between the self-efficacy and their attitude scores of mathematics teachers regarding the education of the gifted?

Method

Research Model

In the study, survey method was used to determine the relationships between two or more variables. The survey method aims to describe a past or present situation as it exists (Karasar, 2006). In this study, it was tried to determine the attitudes and self-efficacy of primary and high school mathematics teachers towards giftedness and gifted education in a relational manner. Researches conducted in the relational research model are studies conducted to determine the level of relationship between variables, without looking at the cause-effect relationship between two or more variables (Büyüköztürk et al., 2016). In this study, the relational model was used to determine whether it has caused change on the attitudes and self-efficacy of gifted students according to demographic information variables such as gender and marital status.

Study Group

The population of this research consists of all mathematics teachers in Niğde province, and the sample consists of mathematics teachers who can be reached within the universe. In this study, convenient sampling method was used depending on the factor of easy accessibility. The convenient sampling method is a method that accelerates the research. Because with this method, the researcher selects the participants who are suitable in terms of both accessibility and proximity (Dawson & Trapp, 2001; cited in Kılıç, 2013). The required permissions were obtained from the teachers to participate in the study. The principle of voluntariness was adhered to in participation in the study.

Table 1. Socio-demographic information on participants

Variables	Group	f	%
Gender	Female	102	59.6
	Male	69	40.4
Marital Status	Married	83	48.5
	Single	88	51.5
Age	25-30 years	83	48.5
	31-35 years	21	12.3
	36-40 years	30	17.5
	41-45 years	24	14
	46-50 years	13	7.6

Table 1 presents that there were 102 (59.6%) female teachers and 69 (40.4%) male teachers. Of the participants there were 83 (48.5%) married participants and 88 (51.5%) single participants. As for the age of teachers, there were 83 (48.5%) participants whose ages ranged from 25 to 30 years, 21 (12.3%) participants whose ages ranged from 31 to 35 years, 30 (17.5%) participants whose ages ranged from 36 to 40 years, 24 (14%) participants whose ages ranged from 41 to 45 years and 13 (7.6%) participants whose ages ranged from 46 to 50 years.

Data Collection Tools

Attitude Scale towards Gifted Education (ASGE)

This scale was used to determine teachers' attitudes towards gifted education. The original scale which was developed by Gagne (1991) had 34 items. The Turkish adaptation of the scale was conducted by Tortop (2014a). As a result of the adaptation study of the scale, 14 items remained. In its current form, the scale consisted of three dimensions: the Needs and Support of the Gifted Children (NSGC), the Opposition to Special Services for the Gifted (OSSG), and the Creation of Special Ability Classes (CSAC). In this study, the Cronbach alpha was calculated as .78 for ASGE and internal consistency coefficients for subscales were determined as .73 for Needs and Support of the Gifted Children

(NSGC); .70 for Opposition to Special Services for the Gifted (OSSG) and .73 for Creation of Special Ability Classes (CSAC). Information related to the evaluation of mean values of the scale and subscales is shown in Table 2.

Table 2. *Information about the evaluation of mean of the ASGE and subscales*

Scale	Item	Totally disagree	Disagree	Not sure	Agree	Totally agree
NSGC	7	7-12.5	12.6-18.1	18.2-23.7	23.8-29.3	29.4-30
OSSG	3	3-5.3	5.4-7.7	7.8-10.1	10.2-12.5	12.6-15
CSAC	4	4-7.1	7.2-10.3	10.4-13.5	13.6-16.7	16.8-20
ASGE	14	14-25.1	25.2-36.3	36.4-47.5	47.6-58.7	58.8-70

NSGC: Needs and Support of the Gifted Children, **OSSG:** Opposition to Special Services for the Gifted, **CSAC:** Creation of Special Ability Classes, **ASGE:** Attitude Scale towards Gifted Education

Gifted Education Self-efficacy Scale for Teachers (GESST)

The scale was used to determine teachers' self-efficacy regarding gifted education. GESST was developed by Tortop (2014b). The scale consisted of 26 items, including 6 dimensions as Academic Qualification (AQ), Mentorship Qualification (MQ), Responsibility (R), Personality Traits (PT), Creativity Fostering Qualification (CFQ), Instructional Planning Qualification (IPQ). In this study, the Cronbach alpha was calculated as .92 for GESST and internal consistency coefficients for subscales were determined as .75 for Academic Qualification (AQ); .85 for Mentorship Qualification; .73 for Responsibility (R); .86 for Personality Traits (PT); .83 for Creativity Fostering Qualification (CFQ) and .85 for Instructional Planning Qualification (IPQ). Information related to the evaluation of mean values of the scale and subscales is shown in Table 3.

Table 3. Information about the evaluation of mean of GESST and subscales

Scale	Item	Totally disagree	Disagree	Not sure	Agree	Totally agree
AQ	3	3-5.3	5.4-7.7	7.8-10.1	10.2-12.5	12.6-15
MQ	4	4-7.1	7.2-10.3	10.4-13.5	13.6-16.7	16.8-20
R	3	3-5.3	5.4-7.7	7.8-10.1	10.2-12.5	12.6-15
PT	7	7-12.5	12.6-18.1	18.2-23.7	23.8-29.3	29.4-30
CFQ	6	6-10.7	10.8-15.5	15.6-20.3	20.4-25.1	25.2-30
IPQ	3	3-5.3	5.4-7.7	7.8-10.1	10.2-12.5	12.6-15
GESST	26	26-46.7	46.8-67.5	67.6-88.3	88.4-109.1	109.2-130

AQ: Academic Qualification, **MQ:** Mentorship Qualification**, R:** Responsibility **PT:** Personality Traits, **CFQ:** Creativity Fostering Qualification, **IPQ:** Instructional Planning Qualification, GESST**:** Gifted Education Self-Efficacy Scale for Teachers

Process

In line with the research permission obtained from the Niğde Provincial Directorate of National Education, the mathematics teachers working in the province of Niğde were provided to fill in the forms related to the scales in the study online.

Data Analysis

The data were analyzed using the SPSS (Version 24) program. Frequency tables were created for sociodemographic questions. Independent sample t-test was applied to see the differences in the means of the variables for the scales that meet the normality assumption. One-way ANOVA test was used to see the results of the scales based on the age variable. Independent sample t-test was applied to see the differences in the means of the variables of gender and marital status for the scales that meet the normality assumption. To see the difference in the means of the variable of age for the scales one-way variance analysis (ANOVA) was applied. Linear regression analysis was conducted to see the scales and variables that predict the needs of gifted and support, opposition to gifted special services, and attitude scales towards gifted education. In addition, Pearson correlation analysis was applied for scales and variables conforming to normal distribution in order to learn the relationship and direction between scales and variables. Analyzes were applied at alpha= .05.

Table 4. descriptive analysis and normality assumptions of scales

Variable	N	*X*	Std. Deviation	Kolmogorov-Smirnov (p)	Skewness	Kurtosis	Cronbach Alpha
NSGC	171	26.49	3.63	.000	-.50	1.03	.739
OSSG	171	10.64	2.37	.000	-.42	-.36	.709
CSAC	171	11.79	3.13	.004	.12	-.48	.730
ASGE	171	48.92	6.71	.200	-.18	.69	.784
AQ	171	9.26	2.24	.000	-.10	-.76	.752
MQ	171	13.01	3.22	.000	-.46	-.11	.853
R	171	10.61	2.08	.000	-.64	.64	.739
PT	171	26.87	3.79	.000	-.30	.64	.866
CFQ	171	23.82	2.83	.000	-.81	1.52	.838
IPQ	171	10.77	2.09	.000	-.34	.05	.852
GESST	171	94.33	12.24	.023	-.50	.59	.926

Note. p< 0,05

In Table 4, the descriptive statistics and normality assumptions of scales and sub-scales are given. When the Kolmogorov - Smirnov value of the attitude and self- efficacy scales towards gifted education is examined, it is seen that it meets the normality assumptions so it can be stated the data has normal distribution (George & Mallery, 2010). Since, Kurtosis and skewness values do not exceed the ±2 limits, parametric tests will be used in analyses related to scales.

The reliability levels of all scales are sufficient. The Cronbach alpha coefficient between .60 and .80 indicates that the scale is moderately reliable, and between 0.80 and 1.00 indicates that the scale is highly reliable (Kayış, 2009; Kılıç, 2016).

Results

Table 5. Mathematics teachers' views related to their attitudes and self-efficacy levels towards gifted education

Scale	**N**	**Min.**	**Max.**	$\overline{X}$	**Std.Deviation**	**Level**
ASGE	171	27	68	48.92	6.71	Agree
GESST	171	51	122	94.33	12.24	Agree

In Table 5, the lowest score of the mathematics teachers' ASGE scale is 27 and the highest score is 68. The mean score of the teachers is "$\overline{X}$=48.92" and the standard deviation is "6.71" for this scale. In addition, the lowest score obtained from the GESST scale is 51 and the highest score is 122. The mean score of the teachers is $\overline{X}$=94.33" and the standard deviation is "12.24". Accordingly, it was determined that mathematics teachers participated in the statements in the ASGE and GEEST scales above the medium level.

Table 6. *T-test results of scales according to gender*

Scales	**Group**	**N**	$\overline{X}$	**S.D.**	**t**	**df**	**p**
Attitude Scale towards Gifted Education (ASGE)	Female	102	49.52	6,.54	1.439	169	.152
	Male	69	48.03	6.90			
Gifted Education Self-efficacy Scale for Teachers (GESST)	Female	102	94.09	12.20	-.305	169	.761
	Male	69	94.68	12.39			

Note. p< .05

In Table 6, independent samples t-test results of the scales according to the gender variable are given. A significant difference in favor of gender was not found between groups according to the attitude scale towards gifted education (p=.152 > .05). Moreover, a statistically significant difference between the groups according to the self-efficacy scale regarding the education of gifted people in terms of gender variable was not found (p=.761> .05).

Table 7. T-test results of scales according to marital status

Scales	Group	N	$\bar{X}$	S.D.	t	df	p
Attitude Scale towards Gifted Education (ASGE)	Married	83	50.09	5.84	2.245	169	.026
	Single	88	47.82	7.30			
Gifted Education Self-efficacy Scale for Teachers (GESST)	Married	83	94.11	12.54	-.233	169	.816
	Single	88	94.55	12.02			

Note. p< .05

In Table 7, independent samples t-test results of the scales according to the marital status variable are given. As it can be seen in Table 7, in terms of marital status variable, a statistically significant difference was found between the groups according to the attitude scale towards gifted education ($t_{(169)}$=2.245, p<0.05). The mean score of the married people's attitude scale towards gifted education ($\bar{X}$= 50.09) is significantly different and larger than the single people's attitude scale mean score ($\bar{X}$= 47.82) towards gifted education. On the other hand, it is not found a statistically significant difference between the groups in favor of the marital status variable according to the self-efficacy scale regarding the education of the gifted (p=.816>0.05).

Table 8. ANOVA results of scales according to age

Scale	Age	N	$\bar{X}$	S.D.	df	F	p
ASGE	25-30	83	48.16	6.77	4-166	1.013	.402
	31-35	21	49.19	5.34			
	36-40	30	48.63	7.75			
	41-45	24	50.25	6.09			
	46-50	13	51.53	6.75			
GESST	25-30	83	94.26	10.77	4-166	.200	.938
	31-35	21	94.80	16.11			
	36-40	30	95.73	11.07			
	41-45	24	93.16	13.88			
	46-50	13	92.92	14.90			

ASGE: Attitude Scale towards Gifted Education **GESST**: Gifted Education Self-efficacy Scale for Teachers

In Table 8, one-way ANOVA test results of the scales to the age variable are given. A significant difference in favor of age was not found between groups according to the attitude scale towards gifted education (p=.402 > .05). Moreover, a statistically significant difference between the groups according to the self-efficacy scale regarding the education of gifted people in terms of gender variable was not found (p=.938> .05).

Table 9. Correlation analysis of scales and subscales

	NSGC	OSSG	CSAC	ASGE	AQ	MQ	R	PT	CFQ	IPQ	GESST
NSGC	1										
OSSG	.268**	1									
CSAC	.196*	.493**	1								
ASGE	.728**	.728**	.747**	1							
AQ	.080	.091	-.090	.033	1						
MQ	-.034	.155*	-.030	.023	.618**	1					
R	.029	.184*	-.018	.073	.392**	.340**	1				
PT	.115	.139	-.013	.105	.458**	.494**	.336**	1			
CFQ	.112	.167*	.024	.131	.338**	.409**	.317**	.676**	1		
IPQ	-.020	.086	-.103	-.028	.539**	.558**	.401**	.490**	.625**	1	
GESST	.069	.186*	-.043	.083	.724**	.776**	.577**	.820**	.770**	.780**	1

Note. **p<.01; * p<.05 **NSGC**: Needs and Support for Gifted Children **OSSG**: Opposition to Special Services for the Gifted **CSAC**: Creating Special Ability Classes **ASGE**: Attitude Scale towards Gifted Education **AQ**: Academic Qualification **MQ**: Mentorship Qualification **R**: Responsibility **PT**: Personality Traits **CFQ**: Creativity Fostering Qualification **IPQ**: Instructional Planning Qualification **GESST**: Gifted Education Self-efficacy Scale for Teachers

There is a positive correlation with 99% confidence between the sub-scale of Needs and Support for Gifted Children (NSGC) and Opposition to Special Services for the Gifted (OSSG) (r=.268 / low level), a positive correlation with 95%

confidence between Creating Special Ability Classes (CSAC) (r=.196 / low level), and a positive correlation with 99% confidence between Attitude Scale towards Gifted Education (ASGE) (r=.728 / high level).

There is a positive correlation with 99% confidence (r=.493 / medium level) between Opposition to Special Services for the Gifted (OSSG) and Creating Special Ability Classes (CSAC), between Attitude Scale towards Gifted Education (ASGE) with 99% confidence (r=.728 / high level), between Mentorship Qualification (MQ) with 95% confidence (r=.155 / very low level), There is a positive relationship between Responsibility (R) with 95% confidence (r=.184 / very low level), Creativity Fostering Qualification (CFQ) with 95% confidence (r=.167 / very low level) and Gifted Education Self-efficacy Scale for Teachers (GESST) with 95% confidence (r=.186 / very low level).

There is a positive correlation (r=.747 / high level) between Creating Special Ability Classes (CSAC) and Attitude Scale towards Gifted Education (ASGE) with 99% confidence.

Academic Qualification is positively correlated with Mentorship Qualification (MQ) with 99% confidence (r=.618 / medium level); between Responsibility (R) with 99% confidence (r=.392 / low level), between Personality Traits (PT) with 99% confidence (r=.458 / medium level), between Creativity Fostering Qualification (CFQ) with 99% confidence (r=.338 / low level), there is a positive relationship between Instructional Planning Qualification(IPQ) with 99% confidence (r=.539 / medium level), there is a positive relationship between); between Gifted Education Self-efficacy Scale for Teachers (GESST) with 99% confidence (r=.724 / high level).

There is a positive correlation with 99% confidence between Mentorship Qualification (MQ) and Responsibility (R) (r=.340 / low level), a positive correlation with 99% confidence between Personality Traits (PT) (r=.494 / medium level), a positive correlation with 99% confidence between Creativity Fostering Qualification (CFQ) (r=.409 / medium level), a positive correlation with 99% confidence between Instructional Planning Qualification(IPQ) (r=.558 / medium level), and a positive correlation with 99% confidence between Gifted Education Self-efficacy Scale for Teachers (GESST) (r=.776 / high level).

There is a positive relationship with 99% confidence between Responsibility (R) and Personality Traits (PT) (r=.336 / low level), a positive relationship with 99% confidence between Creativity Fostering Qualification (CFQ) (r=.317 / low level), a positive relationship with 99% confidence between Instructional Planning Qualification (r=.401 / medium level), and a positive relationship with 99% confidence between Gifted Education Self-efficacy Scale for Teachers (GESST) (r=.577 / medium level).

There is a positive relationship with 99% confidence between and Personality Traits (PT) and Creativity Fostering Qualification (CFQ) (r=.676 / high level), a positive relationship with 99% confidence between Instructional Planning Qualification(IPQ) (r=.490 / medium level), and a positive relationship with 99% confidence between Gifted Education Self-efficacy Scale for Teachers (GESST) (r=.820 / very high level).

There is a positive correlation with 99% confidence (r=.625 / high level) between Creativity Fostering Qualification and Instructional Planning Qualification(IPQ), and a positive correlation with 99% confidence (r=.770 / high level) between Gifted Education Self-efficacy Scale for Teachers (GESST). There is a positive relationship (r=.780 / high level) between Instructional Planning Qualification(IPQ) and Gifted Education Self-efficacy Scale for Teachers (GESST) with 99% confidence.

Table 10. Regression Analysis Related to the Prediction of GESST on OSSG

Predicted	Predictor	B	Std. Error	β	t	p
OSSG	(Constant)	7.252	1.391		5.215	.000
	GESST	.036	.015	.186	2.454	.015

R= .186 R^2= .034 $F_{(1,169)}$= 6.025 p=.015

OSSG: Opposition to Special Services for the Gifted, **GESST**: Gifted Education Self-efficacy Scale for Teachers

Table 10 presents the findings obtained from the linear regression analysis applied to examine the prediction of the score of opposition to special services for gifted students. Gifted Education Self-efficacy Scale for Teachers (GESST) score significantly and positively predicted the score of Opposition to Special Services for Gifted Students (β= .186; p<0.05). In terms of GESST, teachers' self-efficacy for gifted education explained 3.4% of Opposition to Special Services

for Gifted (OSSG) dimension of Attitudes Scale for Gifted Education.

Table 11. Regression analysis related to the prediction of mentorship qualifications on OSSG

Predicted	Predictor	B	Std. Error	β	t	p
OSSG	(Constant)	9.149	.749		12.207	.000
	MQ	.114	.056	.155	2.046	.042

R= .155 R^2= .024 $F_{(1,169)=}$ 4.187 p=.042

OSSG: Opposition to Special Services for the Gifted, **MQ**: Mentorship Qualification

When the findings in Table 11 are analysed, teachers' views on Mentorship Qualification (MQ) significantly predicted their views on Opposition to Special Services for Gifted (OSSG) dimension of Attitudes Scale for Gifted Education (R=.155, *R* 2 =.024) (F(1,169)=4.187, p< .05). Teachers' views on Mentorship Qualification (MQ) explained 2.4% of the total variance for OSSG. According to this, it can be said that Mentorship Qualification (MQ) is a significant predictor on Opposition to Special Services for Gifted (OSSG).

Table 12. Regression analysis related to the prediction of responsibility on *OSSG*

Predicted	Predictor	B	Std. Error	β	t	p
OSSG	(Constant)	8.421	.927		9.087	.000
	Responsibility	.209	.086	.184	2.438	.016

R= .034 R^2= .028 $F_{(1,169)=}$ = 5,942 p=.016

OSSG: Opposition to Special Services for the Gifted

In Table 12, the findings obtained from the linear regression analysis applied to examine the prediction of the score of the sub-scale of Opposition to Special Services for the Gifted (OSSG) are presented. Responsibility dimension score significantly and positively predicts the score of Opposition to Special Services for the Gifted (OSSG) (β= .184; p< .05). Responsibility scale explains 2.8 % of the scale score of being against special services for the gifted.

Table 13. Regression analysis related to the prediction of creativity fostering qualification on OSSG

Predicted	Predictor	B	Std. Error	β	t	p
OSSG	(Constant)	7.300	1.522		4.795	.000
	CFQ	.140	.063	.167	2.208	.029

R= .167 R^2= .028 $F_{(1,169)=}$ 4.874 p=.029

OSSG: Opposition to Special Services for the Gifted, **CFQ**: Creativity Fostering Qualification

Table 13 shows the findings obtained from the linear regression analysis applied to examine the prediction of Creativity Fostering Qualification (CFQ) score on the sub-scale of Opposition to Special Services for the Gifted (OSSG). According to the findings in Table 13, teachers' Creativity Fostering Qualification (CFQ) score significantly and positively predicted the scale score of Opposition to Special Services for the Gifted (OSSG) (β= .167; p<.05). Creativity Fostering Qualification (CFQ) explains 2.8% of the total variance of Opposition to Special Services for the Gifted (OSSG).

Table 14. Regression analysis for predicting the score of the scale of creating special ability classes

Predicted	Predictor	B	Std. Error	β	t	p
CSAC	(Constant)	11.554	.342		33.782	.000
	Age 46-50	1.984	.928	.168	2.135	.034

R= .183 R^2= .034 $F_{(4,166)}$= 1.443 p=.034

CSAC: Creating Special Ability Classes

In Table 14, the findings obtained from the linear regression analysis applied to examine the prediction of the score of the scale of Creating Special Ability Classes (CSAC) are given. If the age is between 46-50 (reference=Age 25-30), the score of creating special ability classes scale increases by 1.984 points (β= .168; p< .05). The age between 46-50 explains 3.4% of the sub-scale of Creating Special Ability Classes.

Table 15. Regression analysis for predicting the score of the scale of attitude scale towards gifted education

Predicted	Predictor	B	Std. Error	β	t	p
ASGE	(Constant)	50.096	.728		68.803	.000
	Marital Status	-2.278	1.015	-.170	-2.245	.026

R= .029 R^2= .023 $F_{(1,169)}$= 5.038 p=.026

ASGE: Attitude Scale towards Gifted Education

Table 15 shows the findings obtained from the linear regression analysis applied to examine the prediction of the Attitude Scale towards Gifted Education (ASGE) score. If the marital status is single 46-50 (reference=Married), the attitude towards gifted education scale score decreases by 2,278 points (β= -.170; p<0,05). The marital status variable explains 2,9% of the Attitude Scale towards Gifted Education (ASGE).

Discussion and Conclusion

In the study in which the attitudes of mathematics teachers towards gifted education and their self-efficacy towards gifted education were examined, it was firstly examined the relationship between teachers' attitudes towards gifted education and their self-efficacy towards gifted education according to the results of the correlation analysis conducted, a significant relationship was not found between teachers' attitudes and self-efficacy. Thus, it was revealed that there was not an expected relationship between attitude and self-efficacy, but the expected relationship was seen in the sub-scales of both scales. According to the results of the research in the literature; it was determined that the mean scores of teachers' self-efficacy were high (Dinçer, 2019). It was also observed that pre-service teachers in Germany and Australia had lower self-efficacy in teaching a gifted student (Matheis, Kronborg, Schmitt, & Preckel, 2017).

Then, it was examined that whether teachers' attitudes towards gifted education varied according to gender. According to the findings, teachers' attitudes towards gifted education did not change significantly according to gender. Similarly, teachers' self-efficacy towards gifted education did not change significantly according to gender. As it is understood from this study, attitudes and self-efficacy characteristics related to gifted education did not vary according to gender. Similarly, Molapo and Salyers (2014) found that there was no significant change in the sub-dimensions of the self-efficacy scale for gifted education according to gender variable. On the other hand, Vatansever Bayraktar, Kadıoğlu Ateş, and Afat (2019) found that classroom teachers' attitudes towards gifted education did not show a statistically significant change in the sub-scales of need for support, opposition to special services, and creating a classroom for gifted students and in general mean scores according to gender variable.

According to the independent samples t-test results of teachers' attitudes towards gifted education according to marital status variable, it was observed that married teachers had a more significant mean attitude score compared to single teachers. However, teachers' self-efficacy towards gifted education did not show a significant change according to marital status. The fact that attitudes towards gifted education differ according to marital status and that married teachers have more positive attitudes may be related to the experience gained. Similarly, there are studies showing that teachers' attitudes towards gifted students are typically affected by experience or lack of experience (Szymanski et al., 2018; Xiang et al., 2011). Again in the literature, when self-efficacy beliefs related to years of service are examined, it is seen that the most inexperienced group tends to see themselves as more competent in the education of gifted children, unlike other groups with more years of service (Oral, 2017).It was concluded that the self-efficacy beliefs of classroom teachers towards gifted education did not show a statistically significant difference according to the marital status variable (Vatansever Bayraktar, Kadıoğlu Ateş & Afat, 2019). Additionaly, ANOVA analysis reveals that there is no significant difference was found according to age of the participants; however, regression analysis revealed that the 46-50 age group was a predictor of creating gifted classrooms.

When the relationships between the sub-scales applied to the teachers were analysed, it was found that the teachers who were positive about the needs and support of the gifted had a high level relationship with their attitudes towards gifted education, a low level relationship with their opposition to special services for the gifted and a low level relationship with creating special gifted classes. It can be concluded that teachers mostly support the idea of supporting the needs of gifted students with special services, while they are less supportive of the idea of creating special classes

according to the needs of gifted students. A review of the literature shows that in Croatia, teachers have a positive attitude towards the needs, support and social value of gifted education, while they have a slightly negative attitude towards special provisions for the gifted (Perkovic´ Krijan et al., 2015). In the literature on gifted education, teachers mostly expressed their views on separate education or heterogeneous classrooms, the characteristics of teachers, the necessity of gifted education, and the educational needs of all stakeholders (families, teachers and children). In this respect, teachers did not see themselves as representatives of gifted education. Most of them had views in favour of separate classes or schools (Akgül, 2021). Another study found that teachers generally had little knowledge about enrichment methods and primarily used supplementary reading materials (Şahin & Levent, 2015). Most teachers talked about the importance of student identification and education. Teachers were of the opinion that gifted students need a higher quality education, but not from themselves, but from others (Akgül, 2021). Another study found that teachers' attitudes towards acceleration and enrichment were somewhat negative (Drain, 2008). It has been suggested that teachers can learn to differentiate curriculum and instruction in regular classrooms (Reis et al., 1993). In another study, it was found that although participants agreed that gifted education is necessary to meet the distinctive intellectual and emotional needs of gifted students, they tended to have negative attitudes towards gifted education in South Korea due to the highly competitive educational atmosphere. On the other hand, South Korean pre-service teachers acknowledged that taking a gifted education course can help in some way but not enough (Woo & Cumming, 2022).

It was concluded that there is a moderate relationship between teachers' attitudes and self-efficacy towards creating special ability classes according to the needs of gifted students. It was concluded that there was a high positive correlation between teachers' views on the needs of gifted students and their attitudes towards gifted education. This can be said that teachers who have positive attitudes towards gifted education have more positive attitudes towards the needs and supports of gifted students. Again, it can be said that teachers with high mentoring and responsibility competencies had a low level of perspective on the needs of gifted students. Similarly, the literature has shown that those who receive gifted education do not have higher attitudes towards gifted students and gifted education (Molapo & Salyers, 2014). Similarly, teachers with a high level of creativity that encourages competence have a very low level of perspective on the needs of gifted students. Torrance (1962) argued that the purpose of guidance/mentoring is not to encourage individuality and creativity, but to promote a healthy balance between individuality, creativity and appropriateness. On the other hand, teachers with high self-efficacy in gifted education have a very low level of perception of the needs of gifted students. Teachers' beliefs about creativity and practices about how to develop creativity were, to some extent, underpinned by their beliefs about gifted education (Chan & Yuen, 2015). The interviewed teachers believed that all students are gifted and that teachers should encourage and support students to reach their potential (Chan & Yuen, 2015). Given the relationship between attitude and behaviour, improving teachers' behaviour and pedagogy requires improving teachers' attitudes towards gifted children and their education (Lassig, 2009).

It can be concluded that teachers with high attitudes towards gifted education have a high tendency to create gifted classes. It was concluded that teachers with high academic qualification had similar levels of mentorship qualification, personal traits and instructional planning qualification. In the literature, it was concluded that the lowest scores received in the mentoring (guidance) activity were appropriate for personal traits and creativity fostering qualification (Oral, 2017). On the other hand, statistically significant results were found for qualification and attitude, which were examined as predictors of teachers' willingness to differentiate teaching for gifted students (Caldwell, 2012). The results of the analysis of metaphors about gifted children reflect various themes related to the characteristics of gifted children. This finding showed that they know the characteristics of these children, their differences from other children, their prevalence, and their superior characteristics (Akgül, 2021). Within the scope of planning teaching, in a study conducted in Finland, teachers supported the placement of these children in regular classes instead of separate classes for gifted students (Laine et al., 2019). Australian teachers, on the other hand, stated that gifted education practices such as ability grouping and acceleration were not labelled (Lassig, 2009). Another finding was that most Czech teachers had ambivalent attitudes towards gifted education due to fear of elitism (Portesov´a et al., 2011).

Teachers with high academic qualification had lower levels of responsibility and creativity fostering qualification, whereas they had high levels of self-efficacy in gifted education. Kirschenbaum (1989) found that highly creative teachers tend to have successful creative students and less creative teachers have less successful creative students. Teachers with high mentoring efficacy had low levels of responsibility, similar levels of personal traits, creativity fostering efficacy, and instructional planning efficacy, and high levels of self-efficacy in gifted education. Matheis et al. (2017) found that teachers can have a significant impact on the educational and personal development of gifted students, and it is important for teachers of gifted students to demonstrate professionalism and expertise not only in their field but also in the requirements of being an effective teacher (Khalil & Accariya, 2016). Gifted teachers can benefit from a variety of teaching methods and resources that can encourage creativity in gifted children (Donerlson, 2008). Another finding of another study is that gifted students emphasised how important it is for their teachers to be aware of their personal needs, to have confidence in their abilities, to be thoughtful, understanding and supportive (Khalil & Accariya, 2016).

Teachers with high levels of responsibility had low levels of personal traitss and creativity fostering qualification whereas they had similar levels of instructional planning competence and self-efficacy in gifted education. Teachers with rich personal traits had high levels of creativity fostering qualification and self-efficacy in gifted education, while their instructional planning qualification was at a similar level. Emphasising the importance of qualities of gifted students, such as leadership, persuasiveness, management skills and charisma, which are not necessarily linked to teaching skills per se, can be associated with personality traits (Khalil & Accariya, 2016). Again, teachers with high levels of creativity fostering qualification have high levels of instructional planning efficacy and self-efficacy in gifted education. Teachers with high levels of instructional planning efficacy also have high levels of self-efficacy in gifted education. With regard to instructional planning, developing the emotional development of gifted individuals is an integral part of a comprehensive and balanced curriculum. Students need to understand their own characteristics, the intensity of their emotions and their need for coping strategies to help them deal with their own problems (Tassel-Baska & Stambaugh, 2008).

Limitations of the Study

One of the limitations of this study is that it was conducted with 171 mathematics teachers. Among the limitations of the research is that it was conducted only with quantitative data. The study can be conducted by including teachers' feedback through qualitative data collection tools. Based on these limitations, some suggestions can be made for future research. The current study can also be conducted in other provinces with a larger study group and groups of teachers from different branches. This study can be conducted using different designs than the research method used. In addition, with the results obtained from the study, mathematics lessons can be organized with innovative approaches in order to support the knowledge of gifted students regarding mathematics education.

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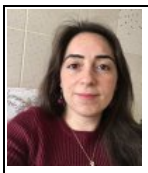

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