Investigation of Lifelong Learning Tendencies and Self-Regulatory Learning Perceptions of Gifted Students

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Abstract

In this study, it is aimed to determine the lifelong learning tendencies and the level of self-regulatory learning skills of gifted students and the relationship between them. In the study, exploratory sequential mixed methods design, one of the mixed method designs, was used. The sample of the study consisted of 168 gifted students who continued their education at a Science and Art Center (SAC) in a city in Eastern Anatolia Region of Turkey in the 2018-2019 academic years. Quantitative data were collected using Lifelong Learning Scale (LLS) and Perceived Self-Regulation Scale (PSRS). Qualitative data of the study were collected by semi-structured interviews conducted with 15 students. The quantitative data of the study were analyzed by independent samples t test, ANOVA and Pearson Product-Moment Correlation analysis. In the analysis of the qualitative data, inductive content analysis was used. As a result of the analysis, it was found that the total scores obtained from the Lifelong Learning Scale and the Perceived Self-regulation Scale did not show a significant difference by gender and program variables. It has been determined that there is a moderate significant relationship between lifelong learning tendencies of gifted students and their perceptions about self-regulation skills. When the opinions of the gifted students about lifelong learning tendencies are examined, it is seen that participants determine the reasons of the problems and go for solutions in line with their purpose, they like to produce solutions by making intellectual struggles, and they make scientific and non-scientific readings and use these readings to produce different solutions. It was also seen that they tried different ways to correct their mistakes. Based on these findings, it can be said that individuals with high perceptions about self-regulatory learning skills have high lifelong learning tendencies. In this context, it is recommended to enrich Science and Art Center's curriculum in order to improve students' self-regulation skills and developing lifelong learning tendencies.

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Introduction

When the historical process is examined all over the world; the first industrial revolution began with the use of steam systems, the second industrial revolution began with the emergence of oil and the increase in production, the third industrial revolution, which was expressed as the informatics revolution began with the emergence of electronics, computers and the internet (Bulut & Akçacı, 2017). The last industrial revolution, which is the result of increasing knowledge levels of societies, replaces manpower with machine power and differs from other industrial revolutions in terms of speed, digitalization and system, is expressed as Industry 4.0 (Schwab, 2016). In order to adapt to this industrial revolution, societies need to have a qualified and internalized labor force. It is important that each individual should possess 21st century skills such as information and technology literacy, critical and creative thinking and lifelong learning in order to enable societies to internalize and integrate the Industrial 4.0 revolution into their lives (Bal, 2018).

21st century skills express characteristics that enable individuals to become qualified employees in today's information society (Ananiadou & Claro, 2009). In the context of 21st century skills, many competences are expressed such as information and technology literacy, problem solving, critical thinking, communication, cooperation, entrepreneurship, cultural awareness, social citizenship, flexibility and financial literacy, adaptability, global competencies and lifelong learning (Yenen, 2019; Yenice & Alpak-Tunç, 2019). Although different ideas have been raised about what the 21st century skills are (Lai & Viering, 2012), it is stated in many studies that it is important for individuals to have these skills (Yalçın, 2018). In line with this aim, many institutions are working on the importance of providing 21st century skills to individuals. For example, in the report prepared by OECD (2018), it is stated that the individuals who are currently students will become adults by 2030, new occupations will emerge and some occupations will be extinct (Cansoy, 2018). This situation reveals the necessity of equipping individuals with different skills. Likewise, the World Economy Form (2016) includes the competencies that employees must have in their future professions report; and to solve complex problems, critical thinking, creativity, reasoning, decision making and negotiation. In order to have these skills, it is not only seen that it is enough to produce products, but it is also necessary for the individuals to constantly renew themselves and to carry their learning processes to their whole life (Harari, 2018). Therefore, equipping individuals with 21st century skills and acquiring individuals with different skills has an important place today (Wagner, 2008) and lifelong learning skills emerge as an important theme in order to acquire these skills by individuals (Yenice & Alpak-Tunç, 2019).

Lifelong learning is the process of increasing individuals' potentials and competences (Dunlap, 2005) to improve their living standards (Demirel, 2009) through formal and informal learning (Candy, 2003). While the European Commission (2006) defines lifelong learning as all lifelong learning activities from personal, social and work-related perspectives in order to advance knowledge, skills and competences; Güleç, Çelik, & Demirhan (2012) emphasized that lifelong learning is important in increasing the value given to people and knowledge and in gaining the basic qualities that individuals should have in their lives. On the other hand, Kılıç (2014) stated that the lifelong learning process is the learning process that individuals continue throughout their lives. Therefore, it has emerged that individuals with this skill should regulate their learning by taking responsibility for their own learning (Knapper & Cropley, 2000). In this respect, the basic philosophy of lifelong learning is the existence of learning at any age and these learning become a way of life (Göçer, 2016; Kaya, 2016). Lifelong learning (Aydın, 2018), which is discussed in educational, economic and social areas, differs from traditional learning environments by its scope, application area and structure (Güleç et al., 2012). Lifelong learning has many aims such as giving individuals the opportunity to renew according to changing conditions (Güler, 2004), ensuring individuals to reach good learning environments (Turan, 2005), and educating individuals with highly skilled labor. Based on these amims, it can be said that lifelong learning includes not only formal education but also adult education and all professional learning activities (Kılınç &

Yenen, 2015). Lifelong learning also aims to provide individuals with the basic skills of communication, managing people and tasks, adapting to different and innovating and self-managing (Evers, Rush, & Berdrow, 1998). Therefore, it is thought that individuals with lifelong learning skills should have self-regulatory learning skills in terms of controlling and evaluating their own learning during the learning process (Yenice & Alpak-Tunç, 2019).

Self-regulation is the cognitive, affective and behavioral processes that individuals put forward to achieve their learning goals (Pintrich & De Groot, 1990; Zimmerman & Kitsantas, 2014). Individuals with self-regulatory learning skills strive to achieve these goals by establishing their own goals (Zimmerman & Schunk, 2011), following themselves in learning environments and conducting activities to improve their deficiencies (Moos & Bonde, 2015). In addition, these individuals use resources effectively in an efficient working environment by organizing information in the learning process (Karabacak, 2014). Many scientists have proposed different models of the self-regulation process. Zimmerman's (2000) self-regulation model consists of forethought, performance and self-reflection stages (Haşlaman, 2018). In the forethought stage, learners make the necessary planning for learning activities (Zimmerman, 2000). The performance stage includes the dimensions of self-control and self-observation and aims to ensure that the learner's learning efforts are optimal. Self-reflection stage includes sub-dimensions of self-judgment and self-reaction and aims to assess individuals' learning processes, learning performance and achievement of personal goals. According to Pintrich (2003), self-regulation process includes cognitive, motivational and behavioral factors. Therefore, individuals with self-regulation skills successfully perform high-level learning activities using processes such as assessment, reflection and monitoring (Stubbé & Theunissen, 2008).It is important for individuals to have lifelong learning and self-regulation skills in order to control their own learning and raise their living standards (Usher & Schunk, 2018). Since the education given in schools is inadequate in solving the problems faced by individuals in real life, after-school learning gains importance (Bağcı, 2011). Intensive use of these skills in renewed curricula (Milli Eğitim Bakanlığı [MEB], 2017) shows the necessity of this situation. In addition, the increase in the amount of knowledge along with technological developments (Hilbert, 2014), the emergence of new professions and jobs require students to acquire lifelong learning (Barroso-Hurtado & Chan, 2019) and self-regulatory learning skills (Siegle, 2013). Therefore, it is important for students of different ages gain these skills and characteristics. One of these groups of students is gifted students with different characteristics according to their peers.

Gifted students are the most important manpower of societies and they differ according to their peers who develop normally in terms of sensitivity, creativity, intense motivation, special skills in different subjects and high level of mental ability (Şahin, 2015). As in other countries, in Turkey, gifted students have been given importance recently. In this context, Science and Art Centers (SAC) were opened in 1995 to help these students to develop their education and potential. In these centers; Educations are provided in different programs such as adaptation, support, individual skill recognition (ISR), special skill development (SSD) and project. In adaptation program, purpose, institution, teachers, activities to be done is introduced to the students who pass the SAC exams. The aim of adaptation program is to adapt students to SAC. In support program, it is aimed to gain the basic skills of the students by doing interdisciplinary work. Students who are successful in support program are admitted to the ISR program. In this program, it is aimed to make the students aware of their skills, to identify the areas they would like to do serious studies in the future, and to make them aware of their attitudes and skills towards the field they want to work in (Ayverdi, 2018). Students who have completed the ISR program are admitted to the SSD program. In SSD program, students conduct scientific and artistic activities aimed at their special abilities. Students who are successful in this program further deepen their studies and take them to a more advanced level within the scope of project production and management program under the supervision of advisor teachers (MEB, 2016). Therefore, these activities

carried out in SAC for gifted students allow these students to become aware of their interests and skills and to use these skills.

There are various studies in the literature that gifted students are motivated at the point of studying independently and using self-regulatory learning skills (Ablard & Lipschultz, 1998; Heller, 1999). It is also known that these students are successful in controlling their own learning and tend to increase their knowledge by taking their learning out of school (Çağlar, 2004a). It is expected that gifted students who can use this kind of self-regulation skills in their lives will have a high level of perception regarding these skills. Because in the literature perception is defined as the process of awareness of objects, features or relationships (Atkinson, Atkinson, & Hilgard, 1995). Therefore, it is expected that the students who have high self-regulation skills and who use these skills in their lives, are expected to be aware of these skills, and their perceptions about these skills should be high. In this regard, the high level of perception regarding self-regulated learning is important in terms of recognizing and developing gifted students' interests and skills (Obergriesser, Steinbach, & Stoeger, 2013). In this context, since students with high level of perception regarding self-regulation skills will tend to use these skills and their lifelong learning tendencies will also be high. Because, in the self-regulatory learning process, students can organize their cognitive and behavioral learning strategies and use their self-regulatory learning strategies in the tasks they encounter throughout their lives (Housand & Reis, 2008). Therefore, students' perception of self-regulatory learning is an important factor in the execution and completion of the tasks encountered in life. Therefore, it is thought that the perceptions of gifted students about lifelong learning tendencies and their self-regulatory learning skills are related. In this context, although there are studies in the literature that self-regulation skills of gifted students are examined in terms of different variables (Betts & Kercher, 2009; Jung, 2017; İspir, Ay, & Saygı, 2011; Oppong, Shore, & Muis, 2018; Tortop & Eker, 2014), there is no study investigating the lifelong learning tendencies of these students and their perceptions about self-regulatory learning skills. It is thought that individuals with lifelong learning skills should also have self-regulatory learning skills (Yenice & Alpak Tunç, 2019) and a high level of perception regarding these skills to be able to organize their own learning. For this reason, this study, which was carried out in order to determine the relationship between the perception of self-regulation skill and lifelong learning tendency, will contribute to the literature in providing empirical evidence to teachers, developers and researchers involved in the education gifted students. In the study carried out for these reasons, answers were sought for the fallowing sub-problems;

1. What is the level of lifelong learning tendencies of gifted students?

2. Do lifelong learning tendencies of gifted students differ by gender?

3. Do lifelong learning tendencies of gifted students differ by the program they are studying?

4. What is the level gifted students' perceptions about their self-regulated learning skills?

5. Do gifted students' perceptions about their self-regulated learning skill differ by gender?

6. Do gifted students' perceptions about their self-regulated learning skill differ by the program they are studying?

7. Is there a significant relationship between lifelong learning tendencies of gifted students and their perceptions of self-regulatory learning skills?

8. How are the views of gifted students about lifelong learning tendencies?

Method

Research Design

This study is a mixed method research using both quantitative and qualitative research methods. The mixed method is a research method that researchers make inference by using quantitative and qualitative methods and approaches (Tashakkori & Creswell, 2007). The mixed research design used in this study is exploratory sequential design. In this design, qualitative data is collected and analyzed after the dominant quantitative data. The aim of qualitative data collection is to explain quantitative data more deeply (Creswell & Plano Clark, 2013). In this context, survey and correlation designs were used in the quantitative dimension of the study, and phenomenology design was used in the qualitative dimension. The survey design is a quantitative research design used in cases where the participants' opinions, interests, skills, perceptions, abilities are tried to be determined (Fraenkel & Wallen, 2006). This design was used at the stage of determining the level of perception of lifelong learning tendencies and gifted students' perceptions about self-regulation skills in terms of various variables. Correlation design, on the other hand, is a quantitative research design used to determine the relationship between two or more variables without interfering with these variables (Fraenkel & Wallen, 2006). In this study, a correlation design was used because it was aimed to examine whether there is a relationship between the lifelong learning tendencies of the gifted students and their perceptions of self-regulatory learning skills. The phenomenology design used in the qualitative dimension of the research is a qualitative research design that examines the experiences that are encountered in daily life (Yıldırım & Şimşek, 2011). Within the scope of the study, the phenomenology design was used because it was aimed to examine the views of gifted students on lifelong learning.

Study Group

The target population of the study consisted of gifted students in Turkey's Eastern Anatolia Region. The accessible population is composed of gifted students studying in a SAC in a city in the Eastern Anatolia Region of Turkey in the 2018-2019 academic years. In sampling, if it is possible, the whole accessible population can be included in the sample of the study (Gürbüz & Şahin, 2016). In this study, all students in the accessible population were included in the study group since the researchers have the chance to reach the all the members of accessible population. In this context, the study was carried out with 168 gifted students enrolled in SAC. Demographic information of the participants in the sample is given in Table 1:

Table 1. Demographic Information of Study Group

Personal Information	*f*	%
Gender		
Girls	82	48.8
Boys	86	51.2
Age		
6-10	48	28.6
11-15	86	51.2
16 and above	34	20.2
Program		
Support	43	25.6
ISR	59	35.1
SSD	35	20.8
Project	31	18.5

When Table 1 is examined; 48.8% of the study group were girls and 51.2% were boys. In addition, 43 of the study group continue their education at SAC in support program, 59 in ISR, 35 in

SSD and 31 in project program. The students in the study group were selected based on the purposeful sampling using the maximum variation method. Maximum variation sampling is selected to provide a diverse range of cases relevant to a particular phenomenon or event (Grix, 2010). In this context, 15 gifted students, who provide maximum variety in terms of gender and program variables, are included in the study group.

Data Collection Tools

In this study, Lifelong Learning Scale (LLS) which was developed by Wielkiewicz and Meuwissen (2014) and adapted to Turkish by Boztepe and Demirtaş (2016) was used to determine lifelong learning tendencies of gifted students. The 5-point Likert-type scale is one-dimensional and consists of 13 items. The minimum score (13x1) that can be obtained from the scale is 13 and the maximum score (13x5) is 65 points. In the study conducted by Boztepe and Demirtaş (2016), the Cronbach alpha reliability coefficient of LLS was .78, and in this study, the Cronbach alpha reliability coefficient of the scale was found to be .74. In addition, the confirmatory factor analysis showed that the scale is one-dimensional (X^2= 277.09, *DF*= 64, RMSEA= .091, NFI= .92, NNFI= .93, CFI= .94, IFI= .94, SRMR= .061).

The Perceived Self-Regulation Scale (PSRS) developed by Aslan and Gelişli (2015) was used to examine the level of self-regulation skills of gifted students. The minimum score (16x1) is 16 and the maximum score (16x5) is 80 points. The validity and reliability study of the scale was carried out by Aslan and Gelişli (2015) with 604 secondary school students. As a result of exploratory factor analysis, it was found that 16 items in the scale consisted of two sub-dimensions named as "openness" and "seeking". Conformity index values were also calculated by conducting confirmatory factor analysis (RMSEA= .042, NFI= .98, CFI= .99, IFI= .99, RFI= .97, CFI= .99, GFI= .94, AGFI= .92, SRMR= .035). In the study conducted by Aslan and Gelişli (2015), the Cronbach alpha reliability coefficient of the PSRSR was calculated as .90 for the whole scale, .84 for the openness subscale, and .82 for the seeking subscale. As a result of repeated reliability analysis in the current study, Cronbach alpha reliability coefficient was calculated as .81 for the whole scale, .80 for the openness subscale, and .77 for the seeking subscale.

Qualitative data were collected from 15 gifted students in the study group through semi-structured interviews. The interview form was prepared by the researchers and during the preparation process, basic skills, thinking skills and personal characteristics that constitute the sub-headings of lifelong learning skills were taken into consideration (Erdamar, 2015). In addition, the opinions of two field experts and a Turkish teacher were asked while preparing the interview questions. In this context, four questions were prepared and probes were added to some questions. There are three probes in the first and third questions, and one probe in the second and fourth questions. For example, "Do you like analyzing problems? Why? "," Do you like intellectual struggles while solving problems? Why?"and "How do you contribute to scientific discussions in school or around you?" probes are added to the first question, The first question aims to investigate how students find solutions to the problems they face in daily life. The second question aims to investigate how students are motivated in their work in school or out-of-school settings. With the third question, it was aimed to investigate whether the students made scientific or non-scientific readings. The fourth question is asked to reveal who and how students communicate in the learning processes.

Data Analysis

In order to test whether there is a difference between the lifelong learning tendencies of gifted students and the scores obtained from the perceived self-regulation scale in terms of gender and program variables, MANOVA was thought to be used. However, since the assumptions of MANOVA could not be met, it was decided to use independent samples t test for comparing the scores by gender and ANOVA for the program variable. In order to carry out these analyzes, normality was controlled

by calculating mean, mode, median, kurtosis and skewness values. In addition, the normality test was conducted to see if the data were normally distributed. As a result of the descriptive statistics, it was seen that the mean, mode and median values of the scores obtained by females and males from LLS and PSRS were close. In addition, the kurtosis and skewness values did not exceed +/- 1 range for both scales (for LLS; kurtosis: .606, skewness: .039; for PSRS; kurtosis: -.417, skewness: .069). After these findings, normality test was carried out to test whether the scores obtained by males and females were normally distributed. Findings related to normality results are given in Table 2.

Table 2. Normality Results for Gender Variable

	Gender	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
PSRS	Male	.065	86	.200*	.988	86	.749
	Female	.072	82	.200*	.979	82	.223
LLS	Male	.140	86	.002	.959	86	.028
	Female	.068	82	.200*	.983	82	.352

In Table 2, Kolmogorov-Smirnov values are examined since the number of females and males is more than 50 (McKillup, 2012). While the scores received by females from PSRS and LLS are normally distributed, the scores obtained by males from PSRS are normally distributed, but the scores of males for LLS are not distributed normally. However, since the mean, mode and median values of the LLS were close to each other and the kurtosis and skewness values did not exceed the +/- 1 range, it was accepted that scores of males were normally distributed for this scale (George & Mallery, 2001). Therefore, it was decided to compare the scores of both males and females from both scales using independent samples t test.

In order to test whether there is a significant difference between the lifelong learning tendencies and perceived self-regulation skills levels of gifted students studying in different programs at SAC, despite of increase in the error, ANOVA is used to compare the results of both scales since the assumptions of MANOVA could not be met. Before using ANOVA, normality of the data is controlled. In this context; mean, median, mode, kurtosis and skewness values were checked and normality tests were performed. According to the descriptive statistics results; mean, mode and median values of the students in four different programs from PSRS and LLS were close to each other. In addition, kurtosis and skewness values did not exceed +/- 1 for both scales (for LLS; kurtosis: .606, skewness: .039; for PSRS kurtosis: -.417, skewness: .069). After these findings, normality test was carried out to test whether the scores of the students studying in four different SAC programs were normally distributed. Findings related to normality results are given in Table 3.

Table 3. Normality Results for Program Variable

	Program	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Statistic	df	Statistic	df
PSRS	Support	.141	43	.045	.978	43	.617
	ISR	.090	59	.200*	.984	59	.680
	SSD	.142	35	.140	.940	35	.099
	Project	.164	31	.096	.959	31	.419
LLS	Support	.107	43	.200*	.954	43	.100
	ISR	.160	59	.001	.960	59	.066
	SSD	.100	35	.200*	.975	35	.689
	Project	.103	31	.200*	.951	31	.291

While evaluating the normality results, the results of Shapiro-Wilk were controlled since the number of students in groups was less than 50 (McKillup, 2012). According to these results, the scores received by all groups from the PSRS and LLS show a normal distribution ($p > .05$ for all groups). Therefore, based on both the mean, mode, median, kurtosis and skewness values and normality test results, it is accepted that the scores of the students for both scales are normally distributed (George & Mallery, 2001). After normality check, one-way analysis of variance (ANOVA) was conducted to determine whether lifelong learning tendencies and gifted students' perceptions about self-regulation skills differ significantly by program variable. In the analysis of the data, the level of significance was accepted as 0.05. In addition, Pearson Product-Moment Correlation Coefficient (r) analysis was used to examine whether there is a significant correlation between lifelong learning tendencies and gifted students' perceptions about self-regulation skills. Pearson Product-Moment Correlation is a statistical analysis used to determine the correlation between the normally distributed variables and the direction of this correlation. If the value of the coefficient is between 0.70-1.00, it is interpreted that there is a high level relationship between the variables, if the value is between 0.70-0.30, correlation is medium, if the value is between 0.30-0.00, it means the correlation between the variables is low (Büyüköztürk, 2017).

"The number of option-1/number of option" formula was used to determine the level of participation to the items in LLS and PSRS. The aim of using this formula is to enable the interpretation of statistical data by making response options continuous. In this context, ranges of scores of LLS and PSRS are given in Table 4.

Table 4. Score Ranges for Scales

LLS and PSRS	
Never	1.00-1.80
Rarely	1.81-2.60
Sometimes	2.61-3.40
Frequently	3.41-4.20
Always	4.21-5.00

Inductive content analysis was used to analyze the qualitative data. The interviews were transcribed from the voice recorder and transferred to the text. The text and voice recording was confirmed by each researcher and by the interviewees. Codes and categories were created based on data. Afterwards, themes were arranged and the findings were interpreted (Corbin & Strauss, 2007). In the findings section, the opinions of the participants were directly conveyed and the names of the participants were given as K1, K2… K15. The codes, categories and themes were formed and they were examined in detail in the findings section. A number of precautions have been taken to increase the credibility, transferability, consistency and repeatability of the qualitative data of the study. In this context, diversification was provided by working with male and female gifted students studying in different curriculum at SAC. The interview form was prepared in accordance with the opinions of the experts, and the audio recordings of the interviews were transferred to the text and the participants were confirmed. In this context, the qualitative findings of the research are presented with direct quotations, the study group, the data collection tool, the data analysis process are explained in detail. Also, interviews were recorded to prevent data loss. In addition, the findings are presented without comments and are discussed appropriately in the conclusion.

Results

Lifelong Learning Tendencies of Gifted Students

Within the scope of the research, the answer of the question "*What is the lifelong learning tendencies of gifted students*?" was sought. In this context, the average (X̄) and standard deviation (S.d.) values of the scores from the LLS are given in Table 5.

Table 5. Descriptive Statistics on Lifelong Learning Scale

	Items of LLS	N	X̄	S.d.
1	I enjoy intellectual challenge	168	4.02	.91
2	I converse with others about new things I have learner	168	3.65	1.18
3	I like to analyze problems and issues in depth	168	3.65	1.20
4	My regular activities involve reading	168	3.36	1.03
5	I am a self-motivated learner	168	3.58	1.17
6	I browse libraries or bookstores for interesting books or magazines	168	4.33	.83
7	I make interesting contributions to discussions in my classes, at work, or with friends	168	4.23	.94
8	My activities involve critical thinking	168	3.75	1.08
9	I read for pleasure or entertainment	168	3.63	1.13
10	I am curious about many thing	168	3.45	1.25
11	I pursue a wide range of learning interests	168	3.61	1.11
12	I like to learn new things	168	3.73	1.07
13	I do a lot of reading that is not required for my classes or job	168	4.08	.92
	General		**3.77**	

When Table 5 is examined, the overall average of the participants' responses to the items in the LLS was calculated as 3.77. Therefore, gifted students' views can be evaluated as "Frequently" with a degree of participation of 3.77 on the whole LLS. On the other hand, it was observed that the item "*I browse libraries or bookstores for interesting books or magazines*" has highest mean score (X̄=4.33) and the item "*My regular activities involve reading*" (X̄=3.36) is the one with lowest mean. In addition, the participants stated "Always" to the item "I make interesting contributions to discussions in my classes, at work, or with friends" (X̄=4.23), while the mean value obtained from the other items was evaluated as "Frequently".

Investigation of Lifelong Learning Tendencies of Gifted Students in Terms of Gender

Within the scope of the research, answer was sought for the question *"Do lifelong learning tendencies of gifted students differ by gender?"* In this context, independent samples t-test was used to examine whether the scores obtained from the LLS differed according to the gender variable. As a result of the analysis, the t-test results of the LLS scores for the female and male gifted students participating in the research are given in Table 6.

Table 6. Mean, Standard Deviation, t and p Values of Total Scores of LLS For Male and Female Participants

Scale	Gender	N	X̄	S.d.	Levene's Test		sd	t	p
					F	**p**			
LLS	Male	86	48.53	6.77	0.031	.861	166	.506	.614
	Female	82	48.51	6.39					

Table 6 shows the t-test results for LLS. When these results were examined, it is seen that there is no statistically significant difference between the LLS total scores of female and male gifted students (p> .05, t =0.506).

Investigation of Lifelong Learning Tendencies of Gifted Students in Terms of Program

Within the scope of the research, answer is sought to the question "*Do lifelong learning tendencies of gifted students differ by the program they are studying?*" In order to answer this sub-problem, one-way analysis of variance (ANOVA) was conducted. The group statistics obtained from the analysis are given in Table 7 and ANOVA results are given in Table 8.

Table 7. Descriptive Statistics Results for the Program Variable

Program	N	$\overline{X}$	S.d.	Standart Error
Support	43	47.55	6.15	.93906
ISR	59	48.91	5.98	.77974
SSD	35	47.62	6.26	1.05964
Project	31	50.12	8.26	1.48523
Total	168	48.52	6.57	.50722

When the descriptive statistics results in Table 7 are analyzed, although the average scores obtained by students studying in the project program ($\overline{X}$=50.12) is slightly higher than the average scores of other groups, the average scores seem to be quite close to each other.

Table 8. Results of ANOVA Statistics

Scale	Source of Varience	Sum of Square	df	Mean of Squares	F	P
	Between Groups	157.069	3	52.356		
LLS	Within Groups	7060.836	164	43.054	1.216	.306
	Total	7217.905	167			

When Table 8 is examined, there is no significant difference between the total scores obtained from the LLS in terms of the program studied [F (3-164) = 1.216; p = .30> .05]. When the descriptive statistics results in Table 7 are analyzed, it is observed that although the average score of gifted students) obtained from the project program ($\overline{X}$=50.12) is higher than the average score of other programs, this difference is not statistically significant.

Self-Regulatory Learning Skills of Gifted Students

In the research, answer is sought to the question "What is the level of self-regulated learning skills of gifted students?" In this context, the average ($\overline{X}$) and standard deviation (S.d.) values of the students from PSRS are given in Table 9.

Table 9. Descriptive Statistics for PSRS

		PSRS	N	$\overline{X}$	S.d.
Openness Dimension	1	I can easily learn even the most difficult topics if I want to.	168	3.70	1.11
	2	I can do my work in line with the goals I set.	168	3.90	1.06
	3	I can easily learn a new subject.	168	4.27	.74
	4	When I don't understand something, I ask my friends for help.	168	3.40	1.05
	5	I can easily spot innovations while learning a topic.	168	3.96	1.01
	6	If something goes the way I don't want it, it bothers me.	168	4.11	.95
	7	I can learn from my mistakes.	168	4.13	1.11
	8	When I learn a subject, I question my performance by looking at my grades in that lesson.	168	3.75	1.10

Table 9. Continued

		PSRS	N	$\overline{X}$	S.d.
Seeking Dimension	9	I try to find different ways of learning a subject.	168	3.65	1.25
	10	I change my working method when I fail	168	3.49	1.13
	11	I can follow my progress towards my goals.	168	3.81	1.15
	12	I develop different ways of solving problems that I encounter while learning a subject.	168	3.88	.91
	13	I follow the plan I made while I was learning a subject.	168	4.07	.95
	14	I try to use different methods when learning a topic.	168	3.74	1.10
	15	Most of the time I pay attention to what I do when I learn a topic.	168	3.91	1.12
	16	I can try many different ways to change something I find out I've learned wrong.	168	4.15	.88
		Total		**3.87**	

When Table 9 is examined, the overall average of participants' responses to items in the PSRS was calculated as 3.87. Therefore, gifted students expressed their views as "Frequently" with 3.87 degree of participation in the whole PSRS. However, the item with the highest score in the openness dimension was "*I can easily learn a new subject*" ($\overline{X}$= 4.27) and the item with lowest score was "*When I don't understand something, I ask my friends for help*". Likewise, the item with the highest score in the seeking dimension was "*I can try many different ways to change something I find out I've learned wrong*" ($\overline{X}$=4.15) and the item with lowest score was "*I change my working method when I fail*" ($\overline{X}$=3.49)

Examination of Self-Regulatory Learning Skills of Gifted Students in Terms of Gender

In the research, answer was sought to the question "*Do self-regulated learning skills of gifted students differ by gender?*" In this context, independent samples t-test was used to examine whether the scores obtained from PSRS differed by the gender variable. As a result of the analysis, the t-test results for the scores of the gifted students who participated in the research are given in Table 10.

Table 10. Mean, Standard Deviation, t and p Values Regarding Total Scores of Male and Female Participants for PSRS

	Dimension	Gender	N	$\overline{X}$	S.d.	Levene's Test F	Levene's Test p	sd	t	p
PSRS	Openness	Male	86	27.31	3.07	2.11	.148	166	.988	.325
		Female	82	26.80	3.59					
	Seeking	Male	86	27.43	4.47	1.94	.165	166	-1.211	.228
		Female	82	28.20	3.29					
	Total	Male	86	54.74	6.00	0.35	.550	166	-.294	.769
		Female	82	55.01	5.81					

When Table 10 was examined, it is seen that there is no statistically significant difference between the total scores obtained from the PSRS for female and male gifted students (For females $\overline{X}$=55.01, For males $\overline{X}$= 54.74) (p> .05, t = -0.294). Likewise, there is no significant difference between male and female participants for openness [t (166) = 0.988; p = .325] and seeking sub-dimensions [t (166) = -1.211; p = .228].

Examination of Self-Regulatory Learning Skills of Gifted Students in Terms of Program Variable

Within the scope of the research, answer is sought to the question "*Do self-regulated learning skills of gifted students differ by the program they are studying?*" In order to answer this sub-problem, one-way analysis of variance (ANOVA) was conducted. The group statistics obtained from the analysis are given in Table 11 and ANOVA results are given in Table 12.

Table 11. Descriptive Statistics Results for the Program Variable

Program	N	X̄	S	Standart Error
Support	43	53.62	5.31	.81039
ISR	59	54.80	5.73	.74663
SSD	35	54.05	6.63	1.21193
Project	31	54.84	6.23	1.12012
Total	168	54.32	5.89	.45492

When the descriptive statistics results in Table 11 are analyzed, it is seen that the average scores of gifted students studying in different SAC programs are close to each other. The differences between these scores were tested by ANOVA and the results are given in Table 12.

Table 12. Results of ANOVA Statistics

Scale	Dimensions	Source of Variance	Sum of Squares	df	Mean of Squares	F	p
		Between Groups	4.220	3	1.407		
	Openness	Within Groups	1856.060	164	11.317	.124	.946
		Total	1860.280	167			
		Between Groups	55.124	3	18.375		
PSRS	Seeking	Within Groups	2840.781	164	17.322	1.061	.367
		Total	2895.905	167			
		Between Groups	47.977	3	15.992		
	Total	Within Groups	5758.398	164	35.112	.455	.714
		Total	5806.375	167			

When Table 12 is examined, it can be seen that there is no significant difference between the total scores obtained from PSRS in terms of the program being studied [F (3-164) = 0.455; p = .455> .05]. Likewise, there is no significant difference between groups for openness [F(3-164) =0.124; p=.946> .05] and seeking sub-dimensions [F(3-164) =1.061; p=.367> .05]

Investigation of the Relationship Between Lifelong Learning Tendencies and Self-Regulatory Learning Skills of Gifted Students

In the study, another research questions was "Is there a significant relation between lifelong learning tendencies and self-regulated learning levels of gifted students?" Pearson Product Moment Correlation Coefficient analysis was conducted to answer this research question. The results obtained are given in Table 13.

Table 13. Pearson Product Moment Correlation Results

Variables	Lifelong Learning	Openness	Seeking	Self-Regulation
Lifelong Learning	1	.255*	.371*	.321*
Openness	255*	1	.226*	.726*
Seeking	.371	.226*	1	.834*
Self-Regulation	.321*	.726*	.834*	1

N:168, *p<.05

When Table 13 is examined, it is seen that there is a moderate relationship between lifelong learning and self-regulation skills total scores of gifted students (r =.321, p<.05). Also, there is a low correlation between lifelong learning and openness sub-dimension of PSRS (r =.255, p<.05). On the other hand, there was a moderate relationship between lifelong learning and seeking sub-dimension of PSRS (r =.371, p<.05). In this context, it can be said that self-regulation skills of gifted students affect their lifelong learning skills positively.

Investigation of the Gifted Students Opinions towards Lifelong Learning Tendencies

The codes, categories and themes that describe the views of the gifted students about their lifelong learning tendencies have been determined. The code, category and themes are given in Table 14.

Table 14. Opinions of Gifted Students on Lifelong Learning Tendencies

Themes	Categories	Codes	Frequency (f)
Problem solving and critical thinking	In the process of analyzing the problem	I reveal the causes of the problem.	5
		I get help from others.	5
		I use my own experience.	3
		I focus on the solution without thinking about it.	1
		I try different ways to help solve.	1
	Intellectual struggles	Intellectual struggles lead to a solution.	8
		Intellectual struggles give different perspectives.	4
		It does not contribute much to the problem solving.	3
Personal characteristics	For self-management and motivation	I get help from my friends and family	7
		I question myself.	4
		My achievements are effective.	4
Reading and knowledge acquisition	Knowledge acquisition by reading	It gives pleasure.	14
		It does not give pleasure.	1
	Readings other than scientific content	Adds different information	11
		Diversify thinking.	2
		It causes unnecessary information to be placed in the mind.	2
	Readings with different scientific content	It opens one's horizon.	10
		It gives different perspective.	3
		Effective in choice of profession.	2
Communication and sharing	In learning process	I don't need anyone in the learning process.	7
		I work with experienced teachers.	5
		I get help from friends and family.	2
		I get the biggest help from the internet and books	1
	Sharing information	Knowledge becomes meaningful if it is shared.	12
		Everyone should have access to the information s/he wants	3

Table 14 examined five participants stated that they manage the analysis process by getting help from others and revealing the reasons that cause the problem with the same percentage. In this context, for example, K5 stated that *"I think about the causes of the problem while producing solutions to the problems I face."* However, three participants stated that they could analyze and solve the problem by considering the situations they encountered in previous problems. In this context, K9 stated that "… *My most important solution is my experiences.*" Also, one of the participants stated that they would concentrate on the solution without analyzing the problem and one said they would try different ways for the solution of a problem.

Eight of the participants stated that they like intellectual struggles and that they are important in solving the existing problems. In this context, K1 stated that "*I would like to discuss a subject and go into an intellectual struggle and I think it is important in solving problems…*" Although four participants stated that intellectual struggles give different perspectives, three of them stated that intellectual struggles did not help to solve problems. In this context, K5 who emphasize the importance of intellectual struggles stated that "*Intellectual struggles and discussions help me to look at things from a different window*." On the other hand, K15 stated that "*I don't think there is any return in the intellectual discussions*"

In the category of self-management and motivation, seven of the participants stated that they received help from their environment. In this context, while K7 is saying "*The most important point for me is my family and friends. Their support and motivation is very important for me to be successful*", K3 stated that "*My source of motivation is my close environment*". Besides, four of the participants stated that the most important source of motivation is their achievements. In this context, K6 said, "*We learn from their life stories that the motivation of scientists with their success has led to new achievements. That's the case for me*". However, K8 who is questioning his own position, stated that "*Where am I, where I am at, this is important for me*"

Fourteen of the participants stated that they become happy and enjoyed when they learn new things by reading. In this context, while K10 is saying "*Reading is the most important medicine for me. Happiness cannot be described when you read and learn new information*", K13 stated that "*It is a great pleasure to read and learn and use this information. Because the information (you learned) becomes useful.*" However, only one participant (K4) stated that it was not pleasure to obtain new information by reading and stated that "*In my opinion, it is a drudgery rather than happiness*".

Eleven of the participants stated that readings other than scientific contents add different information to individuals and two of them stated that they diversified their thinking frames. In this context, while K14 expressed his views by saying "*I do many different readings, not just course books. This helps me to have a different level of knowledge", K2* stated that "*obtaining information without being bound to a specific area enriches our thoughts and perspective.*" However, two of the participants stated that out-of-field readings caused unnecessary information to be kept in the mind. K3 expressed his stand saying "*Loading of unnecessary information exhausts the brain.*"

Ten of the participants stated that reading with different scientific contents widens people's horizons. In this context, K4 stated that *"Following scientific publications from different fields gives people a new vision and horizon."* Besides, two of the participants think that different scientific readings will be effective in their choice of profession.

Seven of the participants stated that they do not need anyone in the learning process. For example, while K11 is expressing his ideas by the words "*I learn what I want to learn. I don't need anybody else here*", K5 said that "*Now, there is something I want to learn and there are resources I can access to what I want. So I can handle it by myself*." On the other hand, five of the participants stated that they received help from experienced teachers; two stated that they received help from family and friends, and one of the participants stated that they received help from internet and books.

Twelve of the participants stated that the information gains meaning if it is shared. In this context, while K12 is expressing his ideas by saying "*Knowledge is the most important treasure. Life without it makes no sense. Therefore, it is necessary not only to know but to share*", K6 stated that "*Knowledge is good when it is shared*". However, three of the participants stated that everyone should have access to the information they want and need, rather than sharing. In this context, K11 who thinks that he did not need others in the process of learning said that "*My knowledge may not make sense for someone else. In this respect, people should access to the information they need by themselves.*"

Discussion, Conclusion and Suggestions

In this study, it is aimed to examine the lifelong learning tendencies and self-regulation skills of gifted students. In this context, a study was conducted with 168 gifted students studying in different programs in a SAC located in Turkey.

The average of the total scores obtained by the gifted students from the lifelong learning scale was found to be 3.77. From this point of view, it can be said that gifted students have a high lifelong learning tendency. For the development of a country, rising of individuals with lifelong learning skills has a notable importance. This situation necessitates lifelong learning (İzci & Koç, 2012). Besides, the high lifelong learning tendency of the gifted students is an indication that these students will take their learning out of school and will use their qualifications in the future (Çitil & Ataman, 2018). For this reason, it is important to prepare and use a special program that combines real life with school in order to develop lifelong learning skills of these students (Gökden-Kaya, 2019), who have special characteristics such as fast and deep learning, research curiosity and creativity (Davis, 2006). Because, unfavorable school environments negatively affect special gifted students in many respects (Altun & Yazıcı, 2018).

Gifted students participated with the highest score to item in the LLS "*I browse libraries or bookstores for interesting books or magazines*" and with the lowest score to the item "*my regular activities involve reading*". Gifted students focus their learning on the areas of their interest. In this context, it is an important finding that the participants make readings that interest them. This finding is supported by the qualitative data collected based on the opinions of gifted students about lifelong learning tendencies (Table 14). As a result of the interviews, a significant number of participants (14 participants) stated that they enjoyed reading, they do scientific and non-scientific readings and these readings widen their horizons. The readings of these students who are likely to take part in the decision-making mechanisms of the country in the near future (Akbaş & Seda-Çetin, 2018) in line with their interests and abilities are important for the development and adaptation of changes to the country. Also, it is thought that lifelong learning skills will be negatively affected if gifted students do not make regular readings. Because gifted students who follow scientific and technological developments in line with their interests and abilities and show high motivation at this point, first of all, they need to know how to read regularly in order to understand, interpret and use the information they read (Aksoy & Öztürk, 2018). Because gifted students, who show high motivation to follow scientific and technological developments in line with their interests and abilities, must first read regularly to understand, interpret and use what they learn (Aksoy & Öztürk, 2018). In order to help these students to gain regular reading habits that are important for lifelong learning, it is necessary to create learning and reading environments based on their interests and abilities.

As a result of the analyzes, it was found that lifelong learning tendencies of gifted students did not differ according to gender (Table 6) and the program (Table 8). In the literature, there are studies reporting that lifelong learning tendencies of individuals with different education levels do not differ by gender (Boztepe & Demirtaş, 2018; Dündar, 2016; Murray 2015; Şahin & Arcagök, 2014; Yurdakul, 2017) and there are also results indicating that they differ (Bulaç & Kurt 2019; Diker Coşkun, 2009; Gökyer, 2018; Gökyer & Türkoğlu, 2018; Kozikoğlu & Altunova, 2018; Yılmaz & Beşkaya, 2018). For example, Boztepe and Demirtaş (2018), in their study examining prospective teachers' lifelong learning and communication satisfaction levels, stated that prospective teachers' lifelong learning tendencies did not differ according to gender. However, Bulaç and Kurt (2019) stated that lifelong learning tendencies

differ in terms of gender and that lifelong learning tendencies of female participants are higher than male participants. Therefore, the difference in gender-related results indicates that it is difficult to generalize the effect of gender on lifelong learning tendencies (Tunca, Alkın-Şahin, & Aydın, 2015). Similarly, as a result of the interviews conducted to determine the views of these students towards lifelong learning tendencies, it was found that male and female participants hold similar opinions. Besides, when the lifelong learning tendencies of gifted students were examined in terms of the program they are studying SAC, there was also no significant difference between groups (Table 8). However, when the findings of the study were examined, it was seen that the total score ($\overline{x}$ = 50.12) obtained by the students who were studying in the project program, which is the last program of SAC, was higher than the average score of the students studying in other programs (Table 7). Therefore, it can be stated that the level of lifelong learning skills of the students who continue their education at SAC increases as they move to the next program. In this respect, it is important to update the curricula and the activities implemented in SAC to provide opportunities for students with lifelong learning skills.

In order to determine the self-regulated learning skills of the gifted students, PSRS was applied and the total score of the students was found to be 3.87. From this point of view, it can be said that gifted students have high perceptions of self-regulatory learning skills. This finding is similar to the study conducted by İspir et al. (2011). İspir et al. (2011), in their study examining the self-regulation competence perceptions of gifted students, stated that the scores obtained by the gifted students from the cognitive arrangements sub-dimension were higher. Self-regulated learning skill which is expressed as a key competence for gifted students (Obergriesser et al., 2013), helps these students to organize their own learning and to develop the qualifications they have. Therefore, in the education of gifted students; many different teaching models such as Purdue Model, Autonomous Learning Model, Renzulli Triple Enrichment Model, Grid Model, Structure of Intelligence Model, Triple Sheet Pillar Model, William and Mary Integrated Curriculum Model are used. Also, it is recommended to use instructional strategies that include self-regulated learning in order to gain the targeted skills of these educational models (Tortop & Eker, 2014). In this respect, the findings show that gifted students are exposed to strategies that incorporate self-regulated learning strategies in SAC.

In openness sub-dimension of SPRS, gifted students participated with the highest score ($\overline{X}$=4.27) to item "*I can easily learn a new subject*" and with the lowest score ($\overline{X}$=3.40) to the item "*When I don't understand something, I ask my friends for help.*" Findings obtained from the interviews show parallelism with this result. Seven of the participants stated that they do not need anybody to learn (Table 14). It is an important result that the students who are able to think flexibly (Uzun, 2004) and who are open to learning (Çağlar, 2004b), express that they can easily learn a subject by themselves. However, it is a subject to be emphasized that students will not ask for help from their friends during the learning process. It is important to find out the reasons why these students, who generally have good social relations (Özince, 2018), do not need to their friends while they are learning. Similarly, in seeking sub-dimension, students participated with the highest score ($\overline{X}$=4.15) to item "*I can try many different ways to change something I find out I've learned wrong.*" This finding is supported by interviews. Individuals with self-regulation skills organize their own learning, try different ways to learn by linking with their knowledge (Cheng, 2011). In this respect, this finding emerges as evidence that gifted students have the ability to regulated learning own learning. However, in seeking sub-dimension, students participated with the lowest score ($\overline{X}$=3,49) to item "*I change my working method when I fail.*" Therefore, it is important to enable gifted students to use different working methods, to give them opportunities to try different learning methods, and to develop their self-regulatory learning skills. To be able to achieve this, expert

teachers should to use blended learning methods that combine face-to-face interaction with online tools such as flipped learning, as well as the other learning approaches such as argumentation, cooperative learning and project-based learning.

It was found in the study that the scores obtained by the gifted students from PSRS did not differ in terms of gender (Table 10). Although there was no statistically significant difference, it was found that the mean score of female participants ($\overline{X}$=55.01) was higher than the mean score of males ($\overline{X}$=54.74). In parallel with this result, Zimmerman and Martinez-Pons (1986) examined the level of use of self-regulated learning strategies by students with special skills and normal development. The researchers concluded that female students had higher grades for note-taking, monitoring, environmental restructuring and goal-setting and planning strategies than male students (Kızkapan, Bektaş, & Saylan-Kırmızıgül, 2018). Similarly, it was found that the self-regulated learning skill levels of gifted students did not differ in terms of the program studied in SAC (Table 12). When the average of the scores obtained by the students studying in each program was examined, it was found that the total score average of the gifted students studying in the project program was high compared to the students studying in other programs (Table 11). Therefore, it can be said that the level of having self-regulatory learning skills increases as the student move on to the higher programs in SAC.

In the correlation analysis conducted to determine the relationship between lifelong learning tendencies and self-regulated learning skills of gifted students, it was found that there is a moderate relationship (Table 13). Similarly, it is seen that the average scores obtained by the gifted students from LLS and PSRS are close to each other. In addition, there is a low level of relationship between lifelong learning and openness sub-dimension of PSRS, whereas there is a moderate relationship between lifelong learning and seeking sub-dimension of PSRSR (Table 13). Based on this relationship, it can be said that as the perceptions of gifted students about having self-regulation skills, their lifelong learning tendencies increase. This finding is supported by interviews. When the views of gifted students about lifelong learning tendencies were examined, significant number of the participants stated that they put forward the reasons of the problems and go to the solution according to certain goals, they like to produce solutions by making intellectual struggles, they question the situation they exist in this process, they make scientific and non-scientific readings, these readings help them to produce different solution ways and they could try different self-regulation skills correct the inaccuracies in their learnings (Table 14).

As a result; gifted students perceptions regarding lifelong learning tendencies and their perceptions about self-regulation skills are high, and do not differ by gender and studied SAC program variables In addition, there is a moderate relationship between gifted students' lifelong learning tendencies and self-regulation skills perceptions. Lastly, it can be said that gifted students are open to learning; they can think flexibly, work autonomously in fields of interest and show continuity in their studies.

Based on all these discussions, it is understood that an education program combining school and real life, providing reading and learning opportunities in line with the student's interests and abilities, is required in the education of gifted students. In addition, the teaching environments of gifted students should be enriched by using different teaching methods and techniques as much as possible. Also, students should be provided with opportunities to develop their self-regulation skills and lifelong learning tendencies. For this, tasks and activities that create cognitive discrepancies and lead students to research and inquiry, and enable individual and group work should be included in their curriculum. Also, it is suggested that SAC's curriculum should be enriched in order to improve students' self-

regulation skills and developing lifelong learning tendencies. In addition, environments should be created to allow students to research and read in line with their interests and abilities. It is also recommended to create environments where students can share their learning with their peers and teachers. In this context, clubs and social environments can be created where students can meet with their peers with similar interests and abilities. As another suggestion, researchers who will study on this subject in the future are recommended to conduct studies that test whether there is a predictive relationship between students' perceptions for self-regulation skills and lifelong learning trends. Also, studies testing the effect of different variables on students' perceptions for self-regulation skills and lifelong learning tendencies can be conducted.

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