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Research Article

Teaching practices and evaluation with distance education of gifted students

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Abstract

It is known that gifted individuals who receive education in Science and Art Centers (SACs) in Turkiye have problems in reaching different educations in accordance with their individual competencies . This study aimed to determine the expectations of gifted students towards distance education, to show that this training can be given with the distance education method after the courses offered through distance education, and to develop an alternative way for the future. Explanatory sequential design, one of the mixed research types in which quantitative and qualitative research designs are used together, was employed in the research. The study group of the research consisted of 40 gifted students and 40 parents of these students in three SACs in Turkiye. The quantitative data of the study were analyzed by using the SPSS program. Quantitative data of the study were obtained with a "10-items student online learning expectations form and 5-items parent evaluation form". Qualitative data of the study were obtained with an 8-items student self-evaluation form. In the research, 4 weeks of distance education were given to the students; "Astronomy, Thinking Skills, Teaching Mathematics with Origami, Robotic Coding, Intelligence Games and Values Education" lessons were explained, and the data obtained at the end of the application were analyzed and interpreted with the MAXQDA program. As a result, it is revealed that gifted students in SACs are quite satisfied with the distance education training within this study's scope. In addition, the present study showed that education programs can be rearranged and made suitable for distance education for the emergent transitions to distance education that emerged with the Covid-19 pandemic.

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Introduction

In a world where technology is used intensively, the limits on accessing information have been removed, and individuals can easily access education in different places from where they are. It is significant to offer the education that individuals need. In recent years, developments in distance education have begun to be seen as an alternative to meeting the educational needs of individuals. Meeting the educational needs of especially talented individuals is extremely important for the future of Turkiye. It is inevitable that these students, who are different from their peers, should be given supportive education outside of formal education. Special talent can be defined as having more creative, successful, and high-level skills than one's peers (Şenol, 2011). In Turkey, Science and Art Centers (SACs) undertake the training of gifted individuals. SACs are educational institutions affiliated with the Ministry of National Education that prepare

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special curricula for gifted individuals by revealing the potential of gifted individuals who receive the same education as other students in formal education. SACs were established to provide education in the fields of science and art for gifted individuals affiliated with the General Directorate of Special Education and Guidance Services of the Turkish Ministry of National Education (TMNE). These educational institutions are independent and carry out studies to provide special talented individuals with appropriate education according to their talents at primary and secondary education levels (TMNE, 2016). In Turkiye, gifted students are educated in SACs. Three skill areas are based on student selection for SACs. These are talent, painting, and music. Students can be shown as gifted in at most two of these fields (TMNE, 2015). The education of gifted individuals is vital for the future of countris. These students need special differentiated education. SACs in Turkey undertook the task of executing the education of gifted children. SACs are not an alternative to formal education institutions, they have the role of supporting formal education (Delibay, 2017). SACs, which offer a differentiated education program different from the education given in normal schools, serve with 106 SAC centers in 80 provinces so that gifted individuals can realize their potential and contribute to themselves and the society (TMNE, 2016).

There are courses that gifted individuals can't take even if they want, and teachers they can't reach to take lessons. It is observed that special talented people have problems in accessing these training due to various reasons such as lack of training that interests these learners, and trainers, who will offer training to these special talented learners, transportation problems, and physical disability of the individuals Lee, Fanguy, Lu, and Bligh; 2021). Appropriate education plans for gifted individuals continue in the world. The important thing here is to integrate these programs with the developing technology and to design them in accordance with the culture of the country. The general structure of the education programs for the education of gifted individuals in Turkiye has been determined as mentoring based on the individual's bridge with the university (Tortop, 2013).

This study aims to go beyond the existing borders and present an alternative education to gifted individuals through distance education and deliver this training to gifted individuals. It can be stated that distance education can be a good alternative to the educational needs of gifted individuals. In addition, arranging education programs for the needs of gifted individuals and offering them to students with the help of distance education will provide equality of opportunity and educational richness among SAC students. In a study by Kaçan and Gelen (2020), many higher education institutions with distance education applications; concluded that they provide distance education with undergraduate completion, undergraduate, associate degree, graduate, certificate, and various training programs, and they carry out their education simultaneously and asynchronously in printed materials, computer-assisted, web environment. The fact that distance education has such widespread use has created the idea that it can also be used in the education of gifted students.

Especially during the COVID-19 pandemic period, it is seen that SAC students' online learning expectations are formed, and their online learning expectations are also reflected in SAC (Händel, Stephan, Zikuda, Kopp, Bedenlier, and Ziegler 2020). Since the students who receive education in SACs are "special students", the education of these students should not be interrupted. In this process, the cooperation of parents, teachers, and students, which constitute the education pillar, is crucial. It is also thought that it can provide information about the students' evaluation of the education they have received, the determination of their needs, and the quality of the education provided. In addition, it is obvious that the education level of the parents, which is the third component of the education pillar, will create an idea about the education that the students receive.

When the studies on SACs were examined (March, 2020), it was concluded that distance education was not provided in these institutions until the COVID-19 pandemic. However, it is thought that rich content can be given with distance education together with the innovations brought by technology. The present era is called the age of technology, and the perspectives of education based on rote are moving away. Raising individuals with the skills of the 21st century and training these individuals in line with the interests of our country has become an inevitable situation in today's conditions. Tortop (2014) asked the opinions of gifted students about mentoring (EPGBU) in a study he conducted, and gifted students reported positive opinions on this subject. At this point, the issue that should be emphasized is the

preparation of education programs suitable for gifted students, rather than the mentoring training for the university, and the training of these students in line with the interests of the country. As a matter of fact, with the emergence of the COVID-19 epidemic disease, which arose in China towards the end of December 2019 and affected the whole world, the alternatives were sought to meet the educational needs of individuals with the closure of educational institutions. Distance education has taken its place as a savior at this point and has been used effectively by many educational institutions. In this process, it was concluded that the education of SAC students was also disrupted, so these students needed a qualified distance education. In this context, it has been understood that the training for the needs of SAC students can be given by the distance education method. Because the purpose of distance education can be defined as providing education and training opportunities to individuals with systems that can keep up with the developing technology and contribute to human education without being affected by time and space, by eliminating the time and geographical barriers that cause the disruption of education (Kaçan & Gelen, 2020).

It can be asserted that special talented people have problems in accessing these training due to various reasons such as lack of training that interests these learners, and trainers, who will offer training to these special talented learners, transportation problems, and physical disability of the individuals. Some courses at SACs are of interest to gifted students. However, the instructor providing this training may not work full time at SACs. In addition, many reasons such as transportation problems and physical disabilities can cause gifted students to not receive the education they want. Therefore, this study aims to go beyond the existing borders and present an alternative education to gifted individuals through distance education and deliver this training to gifted individuals. In this context, by determining the expectations of gifted students about distance education before and after the application, an alternative way for special students has been produced to reveal whether these training can be given with the distance education method.

Problem of Study

The main problem of this research is stated below. According to this;

- How do the distance education applications/courses implemented in SACs meet the expectations of gifted students and their families?

The sub-problems of this research are;

General talented students who take distance education courses in Kars, Ardahan and Iğdır SACs,

- Is there a significant difference between the pretest-posttest scores of distance education online learning expectations of gifted students?
- Is there a significant difference between the pretest-posttest scores of distance education online learning expectation of gifted students according to the SAC' training program to which they are enrolled?
- Do parents' opinions about distance education differ according to the their education level?
- What are the views of gifted students regarding their distance education experiences?

Methods

Research Design

In this study, explanatory sequential pattern was used from mixed research types in which quantitative and qualitative research designs are used together. The explanatory sequential pattern takes place in two stages. In the first stage, quantitative data is collected and analyzed. Then, qualitative data are collected and analyzed. The researcher interprets the utility of qualitative data in explaining quantitative data in this section (Creswell and Plano Clark, 2014). The one-group pretest-posttest design from quantitative research and case study from qualitative research designs were used. Independent variables are applied to the randomly selected group in the one-group pretest-posttest design. There are both pre-test (pretest) and post application (posttest) measurements in this section. (Karasar, 2002). Case study, on the other hand, is explained as a detailed description of a particular system (Merriam, 2013). In the study, it was quantitatively tested whether there is a significant difference between the distance education online learning expectations and the distance education online learning expectations pretest-posttest scores according to the Science and Art Center. In addition, the differentiation of parents' opinions about distance education according to the parents' education level was

also tested quantitatively. In the qualitative dimension; the opinions of students about their experiences in the course process (in the process) were analyzed. Then, qualitative data obtained were interpreted to explain, control, and support quantitative findings.

Sampling and Study Group

Science and Art Centers (SAC) in Turkey constitute the entire universe of the research. The accessible universe of the research consists of Kars Fahrettin Kırzıoğlu Science and Art Center, Ardahan Science and Art Center and Iğdır Science and Art Center students and parents. The sample was created using the convenience sampling technique, one of the non-random sampling types from this study universe. The sample group of the research was composed of 12 students from Kars Fahrettin Kırzıoğlu Science and Art Center, 13 from Ardahan Science and Art Center, and 15 from Iğdır Science and Art Center, who were educated in basic skills 5th and 6th grades in SACs. 40 students and 40 parents of these students. These students are between the ages of 10-12 and 18 of them are girls and 22 of them are boys. The education level of the parents is five primary school, five secondary school, seven high school graduate, twenty-one university graduate and two postgraduate degree.

Data Collection

Student Online Learning Expectations Form

In accordance with the purpose and sub-objectives of the research, two quantitative and one qualitative data collection research forms were created by the researchers. These forms are; the student online learning expectations form, student self-evaluation form, and parent evaluation form applied to parents. 10 items were developed for the student online learning expectations form, 10 items for the teacher observation form, and 5 items for the parent evaluation form. While creating these forms, first of all, the literature was scanned (Devellis, 2017; Şeker and Gençdoğan, 2006), and information was collected about which steps should be followed while creating the data collection tool and the features that should be considered during the article writing phase. After the information was collected, an item pool was prepared in the light of this information. In this process, the opinions of the Education Programs field expert and the Mathematics education specialist were taken, necessary corrections were made and the form was given its final form. A 17-item draft form was developed for the 10-item distance education online learning expectations form, and an 8-item draft form was developed for the 5-item parent evaluation form. Later, these items were presented to the Education Programs field education specialist and the Mathematics field education specialist, and expert opinion was taken. After the expert opinion, some items were removed and the distance education online learning expectations form was reduced to 10 and the parent evaluation form to 5 items, and these forms were also checked by Turkish language experts (2 language experts), and the forms were finalized. For the student self-evaluation form, 13-item open-ended questions were prepared and 6 of these items were removed after expert opinion (Educational Programs field education specialist and Mathematics field education specialist) and took their final form as an 8-item form. Student online learning expectations and parent evaluation forms; It consists of 5-point Likert-type items such as "strongly agree", "agree", "undecided", "disagree" and "strongly disagree"; The student self-evaluation form, on the other hand, consists of 8 open-ended items. For the student self-evaluation form, a form consisting of 8 open-ended questions was prepared. In line with the purpose of the research, a pilot application was made for the reliability analysis of these draft forms, which were created by taking expert opinion. (Buyukozturk et al, 2008). The developed measurement tools were applied to the students of a secondary school selected as a pilot in the Atakum district, in the Science course, and the data were collected. Within the scope of the pilot application, 106 students participated in the survey and the reliability coefficient (Özdamar, 1999) was calculated with the Cronbach's Alpha. “Student Online Learning Expectations Form” was determined as Cr. α = 0.89. In addition, reliability calculations were made with the real data of the research after the application (for confirmation and cross-checking), and this value was determined as Cr. α = 0.87. The reliability coefficient of the "parent distance education evaluation form" was Cr. α = 0, 86. Based on these analyses, the developed (student translation Online learning expectations form and Parent distance education evaluation form) were found to be highly reliable. To ensure the content validity of the research, opinions were obtained from the experts in the field of Mathematics Education and Curriculum and Instruction, and for the qualitative data collection tool, the percentage of agreement between the science education

specialist and the Curriculum and Instruction science experts was examined. The agreement percentage of the two coders was 81.2%. was detected. The study data were gathered online with the "Google Form" platform.

Procedure

The research was planned in 2019 and the pilot implementation was made in March 2020. However, due to the Covid-19 epidemic disease (pandemic) that emerged in China towards the end of 2019 and affected the whole world, all educational institutions (including SACs) were temporarily closed in March 2020 (in Turkey), and distance education was made. This situation affected the implementation process of the study and therefore the actual implementation of the research could be started in March 2021. In the research, firstly, data collection instruments were created. After the data collection instruments were created, pilot implemantations were made and the reliability calculations of the data collected from the pilot implementation were made. After the reliability calculations of the measurement instruments, the courses to be given by distance education in Science and Art Centers were determined. The selection of the courses to be given by distance education was determined in consultation with the administrators and teachers "In line with the wishes and suggestions of the teachers and administrators", taking into account the needs in Kars, Ardahan and Iğdır SACs. The courses to be taught are; It has been determined as "Astronomy, Thinking Skills, Teaching Mathematics with Origami, Robotic Coding, Intelligence Games and Values Education". In addition, in this process, ethics committee approval was obtained with an official letter from the Social and Human Sciences Ethics Committee of Ondokuz Mayıs University. In addition, necessary permissions were obtained from the Ministry of National Education, General Directorate of Special Education and Guidance Services. In order to determine the problems that may be encountered during the implementation, a course is selected among the determined courses; Distance education and pilot courses were given to Kars, Ardahan and Iğdır SAC students. After the pilot implementation, an implementation plan was prepared for the actual implementation and then the actual implementation was started.

The implementation of the study was done on Sundays and lasted for 4 weeks. After the implementation plan was prepared, a WhatsApp group was created to ensure communication and coordination with the students. Basic skills 5th and 6th grade students, parents and SAC administrators, who were educated in Kars, Ardahan and Iğdır SACs, were included in this group.

In addition, a poster was prepared to promote the study and this poster was shared with the group, giving detailed information about the study, and it was also shared that non-voluntary students could leave the group. At this stage, some students and parents left the group.

After sharing detailed information about the research, pretests were started to be applied and pretest data were collected online. After the pretest data were collected, the practice courses started and the practice courses lasted for 4 weeks. After the practice courses, posttests were also applied and data were collected and the implementation was terminated. In the four-week period:

- In the astronomy course; The stages of stellar life, planets, the formation of the universe, the satellites in the sky, the solar system, and the formation of the world were discussed,
- In the course of teaching mathematics with origami; Triangle, square, rectangle and angles topics were handled,
- In the values education course; The topic of values education in the period of human cultural development was handled,
- In the course of developing thinking skills; Solving extraordinary life problems, decision making, critical thinking and creative thinking are covered.
- In the Intelligence Games lesson; Mangala, Pentamino, Go, Abalone, Quarto games shown
- In the Robotic Coding course; Circuit building on Tinkercad program, burglar alarm system with Arduino, traffic light application, RGB led application and button led burning applications were made.

Screenshots were also taken during the study. Screenshots of the application lessons are presented below.

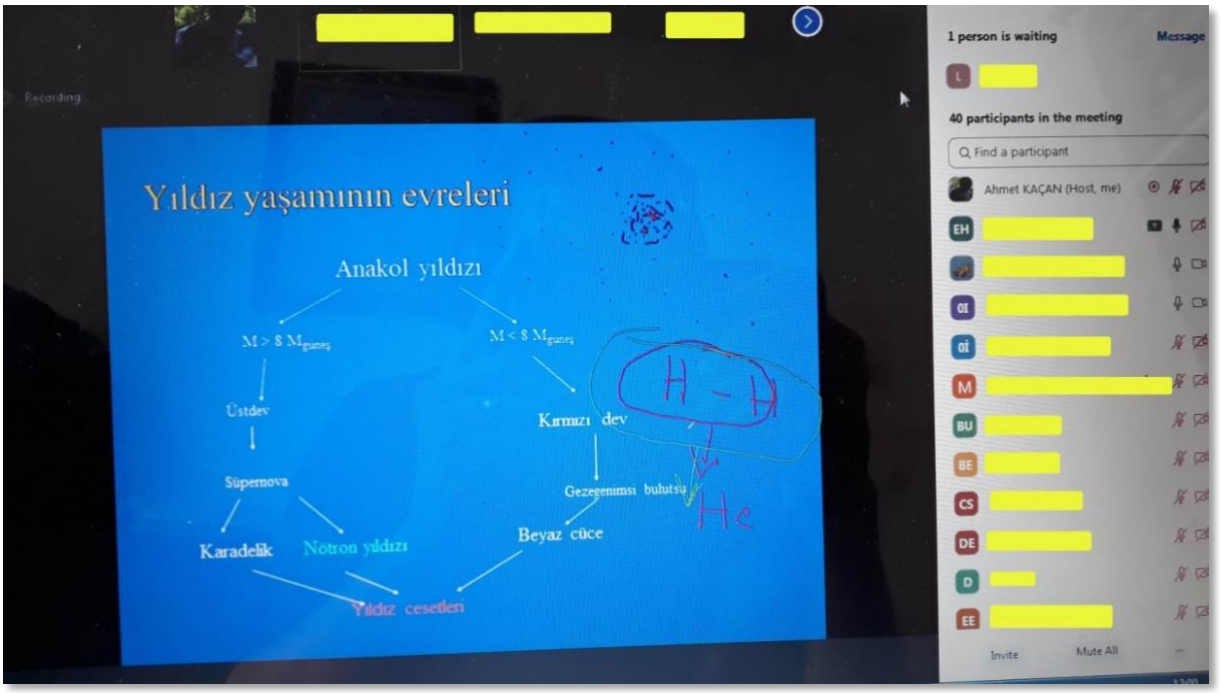

Figure 1. Screenshot of the Astronomy Course

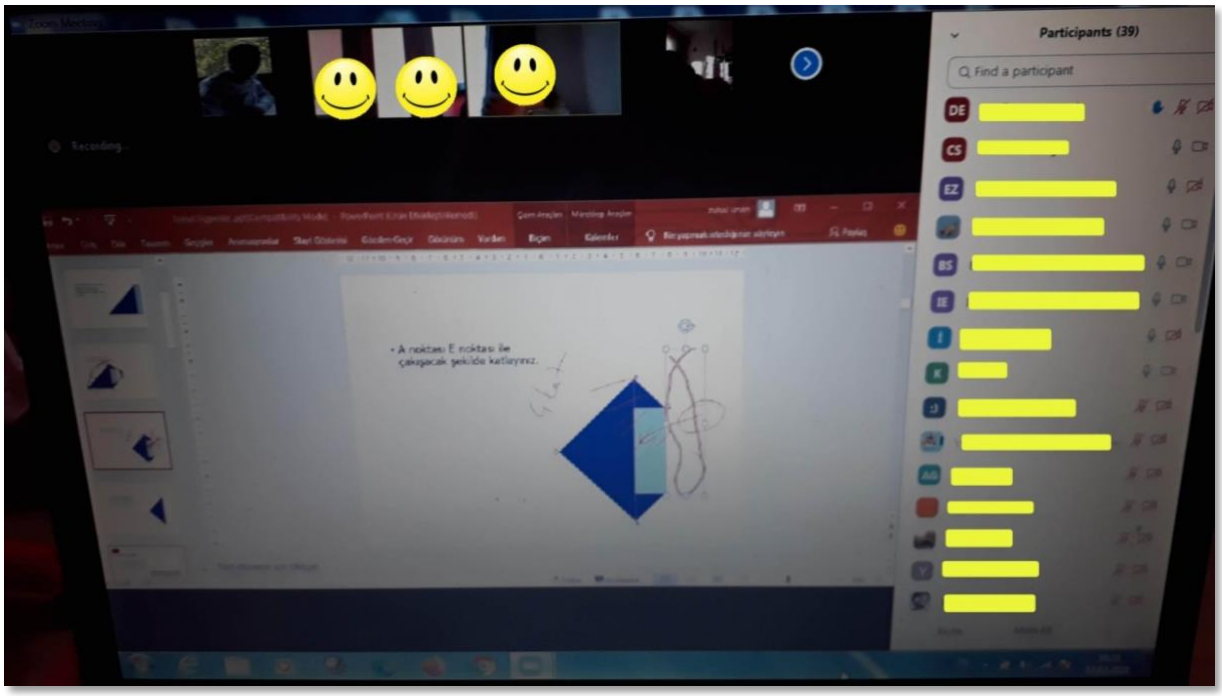

Figure 2. Screenshot of the Origami Lesson

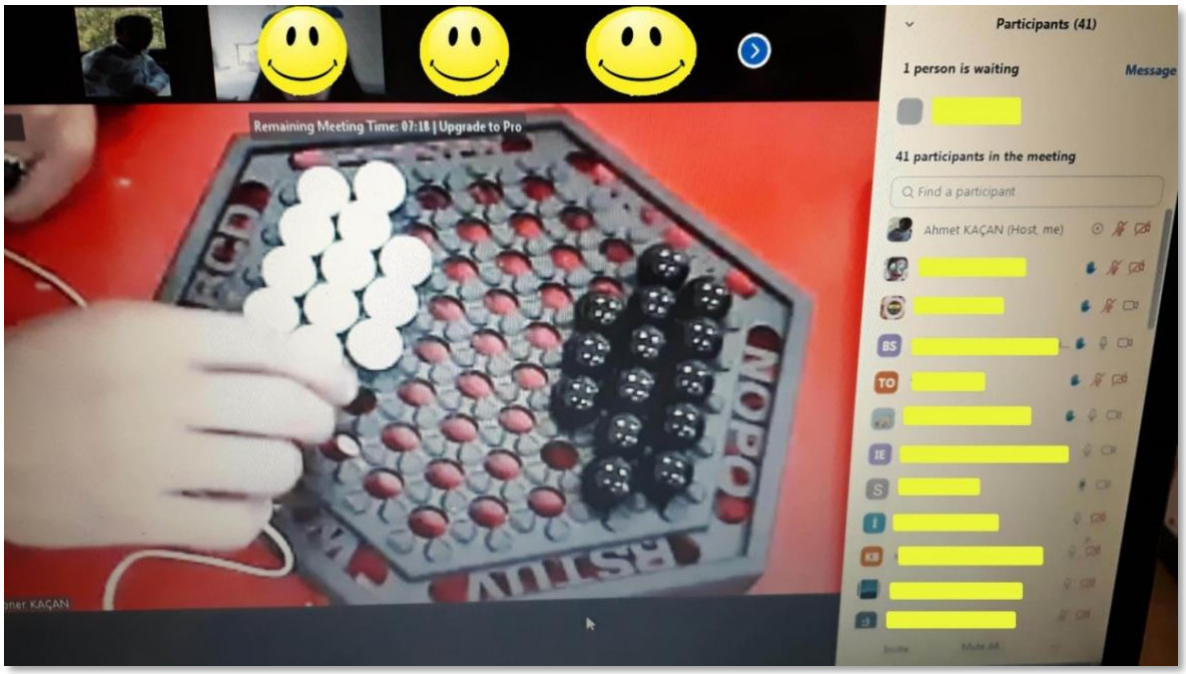

Figure 3. Screenshot of the Intelligence Games Lesson

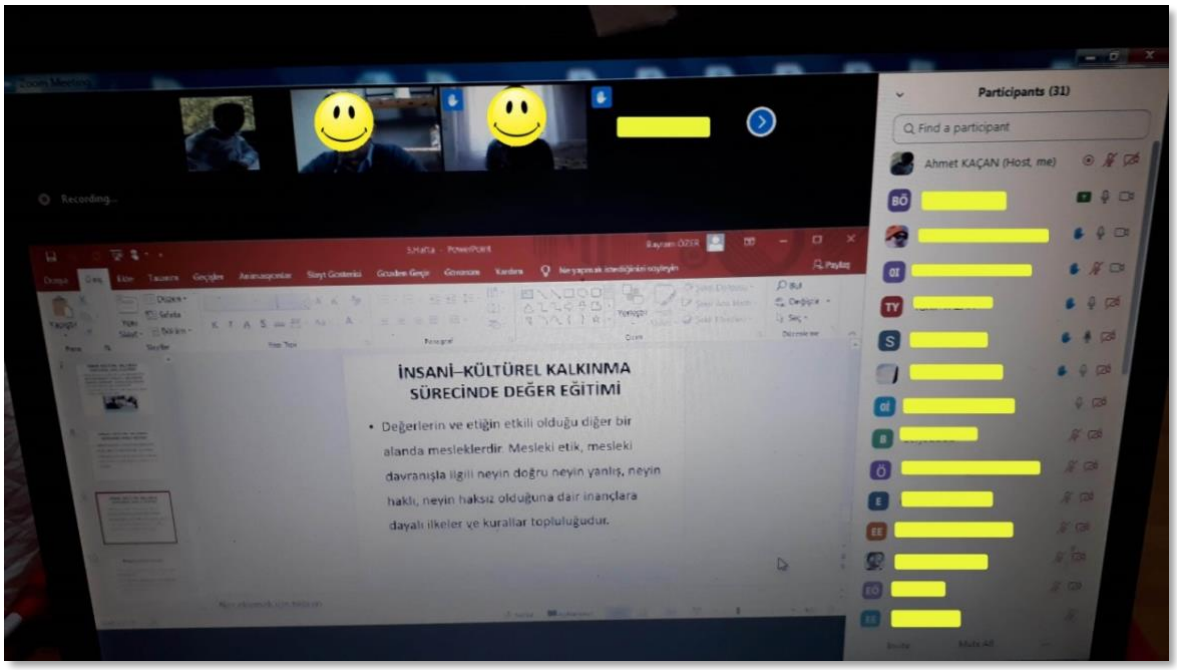

Figure 4. Screenshot of Values Education Lesson

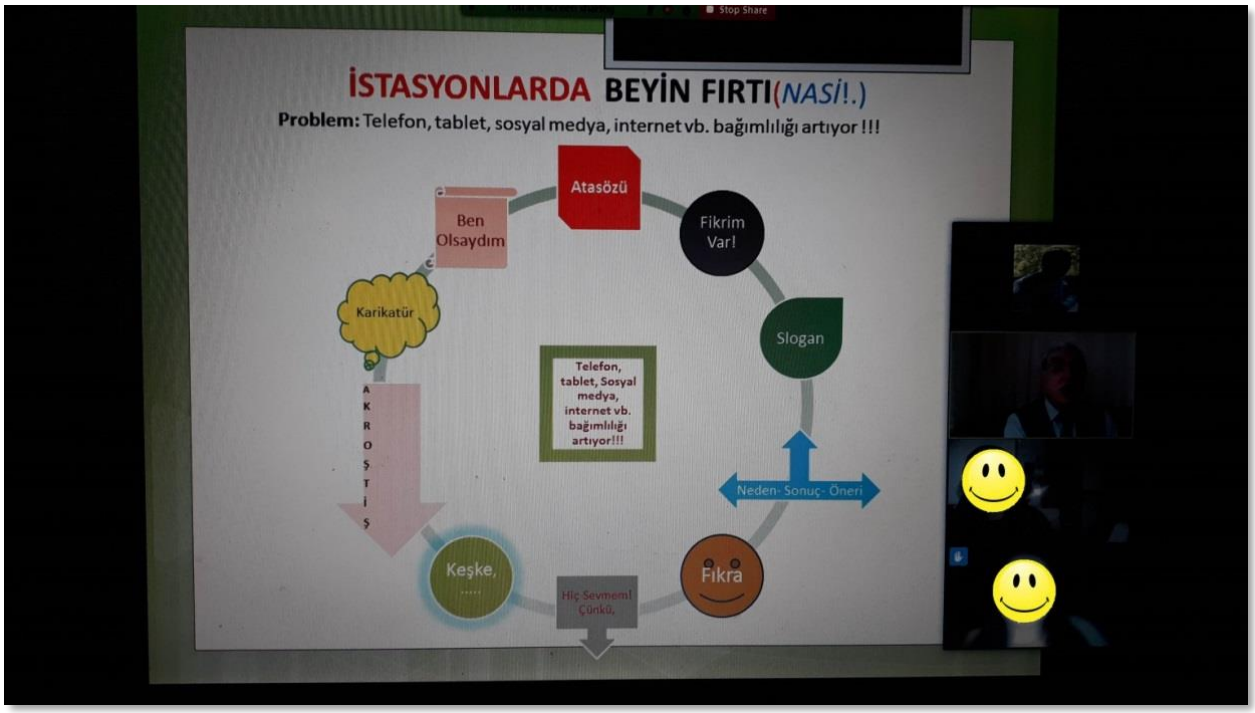

Figure 5. Screenshot of the Thinking Skills Course

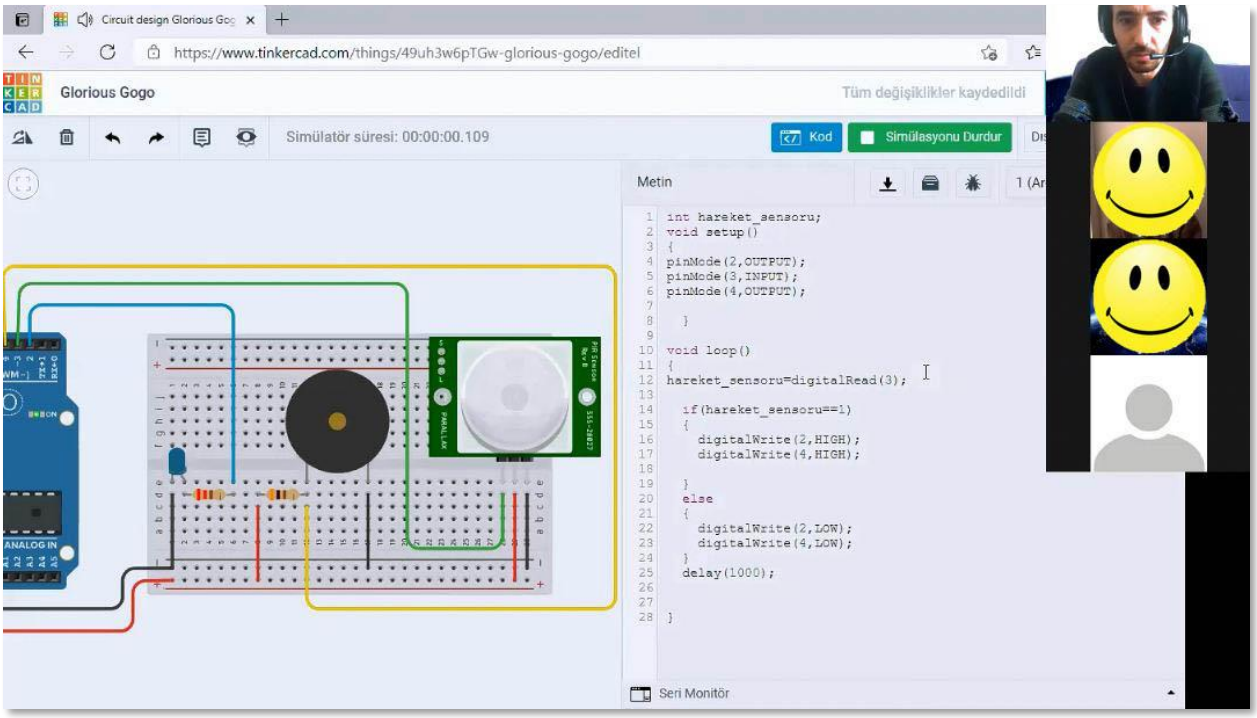

Figure 6. Screenshot of Robotic Coding Course

Data Analysis

As a result of the research, the quantitative data obtained from the measurement tools were analyzed in the SPSS program, and the qualitative data were analyzed in the MAXQDA program. Likert-type student online learning expectations form; The analysis was carried out by giving the values 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree. Likert type teacher observation form; The analysis was performed by giving the values 1=very poor, 2=poor, 3=moderate, 4=good, and 5=very good.

Concerning to determine the distribution of pretest-posttest scores, normality test was performed, Skewness and Kurtosis values of both measurement tools were calculated and normal distribution conditions were met (George and Mallery, 2010). In the analysis of quantitative data, t-test and analysis of variance (ANOVA), which are parametric test techniques, were performed. The data obtained from the student self-evaluation form, which constitutes the qualitative

part of the research, was tried to be analyzed with the coding in the MAXQDA program. Qualitative research data obtained in content analysis; It includes stages such as coding the data, finding the themes, organizing and interpreting the codes-themes (Yıldırım & Şimşek, 2016). In the data obtained from the student self-evaluation form, the percentage of agreement of the two coders was examined. According to Kabapınar (2003), a consistency of 80% and above between two coders, and a consistency of 70% and above between two coders according to Miles and Huberman, shows that the data analyzes are reliable (as cited in Türnüklü, 2000). The percentage of agreement obtained for this study was determined as 82.05%, which indicates that the research data analyzes provide a high level of agreement reliability between raters.

Findings and Discussion

In this section, the findings obtained as a result of the research are given.

Is there a significant difference between the pretest-posttest scores of distance education online learning expectations of SAC students' ? Findings related to the sub-problem

In order to determine the distribution of pretest-posttest scores, data set normality test conditions (Skewness Kurtosis value test) was performed and parametric test conditions were provided. Then, paired samples t-test was conducted to test whether there was a significant difference between the pretest-posttest scores of the distance education online learning expectations of SAC students.

Table 1. Paired Samples T-Test Analysis Between the Pretest-Posttest Scores of the Students

Test	N	$\bar{X}$	ss	df	t	p
Pretest	40	24	5,64324	39	-12,745	0,00
Posttest	40	37,125	5,32622			

Considering the findings obtained as a result of the first sub-problem of the research, distance education online learning expectations pretest score arithmetic mean value $\bar{X}$=24; The arithmatic mean of distance education online learning expectations posttest scores was found to be $\bar{X}$=37,125. Paired groups t-test analysis was performed to determine whether there was a significant difference between pretest-posttest scores and it was determined that students' online learning expectations showed a significant difference (p=.000) in favor of their posttest scores. It is thought that the increase in the average and the decrease in the standard deviation after the application, the students get closer to each other (positively), which means that the education given to the students have a positive effect on the students. According to this information, when the pre-application and post-application data of the students in the distance education online learning expectations form items are examined, it can be interpreted that their thoughts have changed positively after the application.

Gifted Students' Online Learning Expectations

The findings related to this sub-problem are shown in the tables below.

Table 2. Descriptive Statistics about the Students' Scores on Online Learning Expectations By SAC Where They Received Training

	N	$\bar{X}$	ss
Kars SAC	12	11,0000	5,30866
Ardahan SAC	13	16,6154	6,27878
Iğdır SAC	15	11,8000	6,72097
Total	40	13,1250	6,51305

When the group statistics shown in Table 2 were examined, it was determined that 12, 13, and 15 students participated in the study from Kars, Ardahan, and Igdır SACs (Science and Arts Centers), respectively and the mean scores were 11 among the students from Kars, 16.61 among the students from Ardahan, and 11.80 among the students from Iğdır while the standard deviations were found to be 5.30 for the scores of the students from Kars, 6.27 for the scores of the students from Ardahan, and 6.72 for the scores of the students from Iğdır.

The Levene test statistics conducted for testing the homogeneity distribution of the data showed that the data obtained from the student questionnaires had an equal variance, namely, were homogeneously distributed by SAC they received training (p>.05). Therefore, the ANOVA analysis was performed.

Table 3. ANOVA Findings Regarding the Students' Scores on Online Learning Expectations by SAC Where They Received Training

	Sum of Squares	df	Mean of Squares	f	p	Source of Difference
Inter-groups	238,898	2	119,449	3,122	0,05	1-Kars SAC-2-Ardahan SAC
Intra-group	1415,477	37	38,256			
Total	1654,375	39				

According to the data in Table 3, as a result of the ANOVA analysis performed for determining whether there is a statistically significant difference between the pre-test and post-test mean scores of the students by SAC they received training, the significance value between the pre-test and post-test scores was calculated to be p=.05, which shows that there is a significant difference. To determine between which SACs this difference is significant, a Post Hoc test was conducted and the findings are shown in the table below.

Table 4. Post Hoc Test of the Pre-Test and Post-Test Scores on Online Learning Expectations by SAC Where They Received Training

	Kars SAC	Ardahan SAC	Iğdır SAC
Kars SAC	-	*p=0.029	-
Ardahan SAC	*p=0.029	-	*p=0.047
Iğdır SAC	-	*p=0.047	-

In the light of the analysis of the data in Table 4, the significance value between Kars SAC and Ardahan SAC was found to be p=.026, and it was found p=.047 between Ardahan SAC and Iğdır SAC. As the significance values are less than .05, there is a statistically significant difference between the online learning expectations pre-test and post-test scores of the students.

When the findings related to the "SAC where the students received training", the difference between the pre-test and post-test scores on online learning expectations of students in distance education was found to be significant between Kars SAC and Ardahan SAC; and between Ardahan SAC and Iğdır SAC. According to this finding, it can be interpreted that students' expectations can change by the SAC where they received training.

Gifted Students' Family Education Level & Distance Learning

The findings related to the sub-problem of "Do SAC students' parents' opinions differ by the education level of parents (1-Primary school, 2-Secondary school, 3-High school, 4- University, and 5-Post-graduate)?" are given below.

Table 5. ANOVA Test Findings by the Education Level of Parents

		Sum of Squares	sd	Mean of Squares	F	p	Source of difference
I want my child to receive the training that he/she needs (but not provided in SAC where he/she is studying) through distance education	Inter-groups	10,408	4	2,602	3,080	,028	1-2, 1-4, 3-4, 3-5
	Intra-group	29,567	35	,845			
	Total	39,975	39				
I want my child to be trained by teachers from other SACs through distance education.	Inter-groups	7,975	4	1,994	1,836	,144	2-4
	Intra-group	38,000	35	1,086			
	Total	45,975	39				

I want my child to be trained by academicians from universities through distance education.	Inter-groups	1,576	4	,394	1,147	,351
	Intra-group	12,024	35	,344		
	Total	13,600	39			
I think that distance education will answer my child's educational needs.	Inter-groups	5,580	4	1,395	,665	,620
	Intra-group	73,395	35	2,097		
	Total	78,975	39			
I think that distance education is an appropriate alternative for the training my child may need.	Inter-groups	3,894	4	,974	,680	,610
	Intra-group	50,081	35	1,431		
	Total	53,975	39			

When the data in Table 5 were examined to find out whether the parents' opinions differ by their education level, in the item "I want my child to receive the training that he/she needs (but not provided in SAC where he/she is studying) through distance education.", it was seen the scores of parents with primary school level differ significantly from the scores of the parents with high school and university level of education and the scores of those with a post-graduate level of education differ significantly from the scores of those with a high school level of education. To determine between which education levels this difference is significant, a Post Hoc test was conducted and the findings are shown in the table below.

Table 6. The Post-Hoc Analysis Demonstrating the Source of Difference in the Item "I Want My Child To Receive The Training That He/She Needs (But Not Provided in SAC Where He/She is Studying) Through Distance Education" By The Education Levels Of Parents

	Primary School	**Secondary School**	**High School**	**University**	**Post-graduate**
Primary School	-	*p=,046	-	*p=,012	-
Secondary School	*p=,046	-	-	-	-
High School	-	-	-	*p=,013	-
University	*p=,012	-	-	-	-
Post-graduate	-	-	*p=,013	-	-

According to the crosstabulation, the p values of the first item were found to be *p<=.046, p<=.012, and p<=.013. As a result of the analysis of the data about the first item, the significance values were p<.05 for the paired education levels of primary-secondary school, primary school-university, and high school-university. The value of p<.05 indicates a statistically significant difference between these groups. To see at which education levels the differences regarding the first item are more significant (in favor of which education level), the descriptive statistics table was referred to and the findings are as follows:

Table 7. Descriptive Statistics on Whether Parents' Opinions Differ by Their Education Level

		N	$\bar{X}$	**ss**
I want my child to receive the training that he/she needs (but not provided in SAC where he/she is studying) through distance education	**Primary school**	5	2,60	1,517
	Secondary school	5	1,40	,548
	High school	7	2,43	1,512
	University	21	1,38	,498
	Post-graduate	2	1,50	,707
	Total	40	1,73	1,012

The data were analyzed to determine whether parents' opinions differ by their education level and it was seen that parents' mean scores for the first item by their education level were $\bar{X}$=2.60 for the primary school level, $\bar{X}$=1,40 for the secondary school level, $\bar{X}$=2,43 for the high school level, $\bar{X}$=1,38 for the university level, and $\bar{X}$=1,50 for the post-graduate level.

Table 8. The Post Hoc Analysis Displaying the Source of Difference in the Item "I Want My Child To Be Trained by Teachers From Other SACs Through Distance Education." by the Education Level of Parents

	1-Primary School	2-Secondary School	3-High School	4-University	5-Post-graduate
Primary school	-	-	-	-	-
Secondary school	-	-	-	*p=.030	-
High school	-	-	-	-	-
University	-	*p=.030	-	-	-
Post-graduate	-	-	-	-	-

According to the crosstabulation, the p values found based on the education levels of parents were *p<=.030. The significance level for the second item was determined to be less than .05 in the paired education level of secondary school - university. The p-value less than .05 indicates a statistically significant difference. To see at which education levels the differences regarding the second item are more significant (in favor of which education level), the descriptive statistics table was referred to and the findings are as follows:

Table 9. Descriptive Statistics on Parents' Opinions by Their Education Level

		N	$\bar{X}$	ss
I want my child to be trained by teachers from other SACs through distance education	**Primary school**	5	1,80	,447
	Secondary school	5	2,60	1,817
	High school	7	2,14	1,574
	University	21	1,43	,676
	Post-graduate	2	1,00	,000
	Total	40	1,73	1,086

It was seen that parents' mean scores for the second item by their education level were $\bar{X}$=1.80 for the primary school level, $\bar{X}$=2.60 for the secondary school level, $\bar{X}$=2.14 for the high school level, $\bar{X}$=1.43 for the university level, and $\bar{X}$=1.00 for the post-graduate level.

The findings related to the third sub-problem of the study were examined to find out whether parents' opinions differ by their education level. When the first item "I want my child to receive the training that he/she needs (but not provided in SAC where he/she is studying) through distance education" was examined, it was seen that the scores of parents with a primary school level of education differed significantly from the scores of those with a secondary school and a university level of education, the scores of those with a high school level of education differed significantly from the scores of those with a university degree, and the scores of those with a post-graduate degree from the scores of those with a high school degree. Briefly, for the first item, it can be interpreted that significant differences were seen between the paired education levels of primary school-secondary school, university-primary school, and postgraduate-high school. For the second item "I want my child to be trained by teachers from other SACs through distance education." a significant difference was seen between secondary school and university levels of education. Based on these findings, it can be said that parents' education level can be a determinant of their opinions.

Opinions about Distance Learning Experience

Findings related to the sub-problem of "What are SAC students' opinions about their experiences in the course process?" are given below:

Table 10. Content Analysis of the Opinions of Gifted Students about the Opinions about Distance Learning Experience

Theme	Codes	Students	Frequency (f)	Percentage (%)
Opinions about Distance Learning Experience	**Useful**	s1,s4, s12 s16,s19,s22,s23, s27,s31,s34, s35,s36,s39	13	32,5
	Being useful face-to-face	s5,s8,s9,s13,s18, s24,s25,s26,s30,s38	10	25
	Unuseful	s17,s20,s21,s29,s32, s33	6	15
	Acquired new knowledge	s2,s3,s14,s28,s40	5	12,5
	Education in different fields	s7,s10,s11,s31	4	10

When Table 10 about the first item was examined, it was seen that 32.5% of the students found distance education useful, 25% found being useful face-to-face, 15% found distance education unuseful, 12.5% said that it acquired new knowledge, and 10% said that they received education in different fields.

In the light of these data, these percentages can indicate that the training given through distance education was useful and the high number of students who said that it provided new information in different fields can be interpreted that the training provided through distance education was found useful by the students. In a study by Leontyeva (2018), a scale was applied to determine the students' attitudes towards distance education, and they were asked whether they liked using online courses or not. 90% of the participants responded positively by expressing that they can learn the subjects whenever they want. Moreover, 95.6% of them, almost all, evaluated the efficacy of e-courses positively. In a meta-analysis study conducted, Nguyen (2015) reported that 92% of the distance education and online education studies revealed that distance learning and online learning were found to be an efficient type of learning, though not being as efficient as the traditional face-to-face learning and 3% of the studies revealed that face to face education was found more effective, and 4% of the studies revealed mixed findings.

Taking the Desired Course with Distance Education

Table 11. Content Analysis of the Opinions of Gifted Students about the Taking the Desired Course with Distance Education

Theme	Codes	Students	f	%
Taking the Desired Course with Distance Education	Positive	s1,s2,s4,s7,s8, s10,s11,s14, s19,s22,s23, s24,s26,s27,s28,s30, s31,s32, s34,s35,s40	21	52,5
	Face-to-face preference	s5,s12,s13,s18,s20, s21,s25, s33, s39	9	22,5
	Taking all courses	s3,s6,s16,s37	4	10
	Independence of venue	s17,s36	2	5
	Cannot be taken	s29,s38	2	5

When Table 11 was examined, it was seen that what do you think about the chance of receiving through distance education the training that you wanted but could not get? Responded that it 52.5% of the students positive, 22.5% responded that they could face-to-face preference, 10% responded that taking all courses, 5% responded that independence of venue and 5% responded that courses cannot be taken. In the light of these data, it can be interpreted that students were highly willing to take some courses through distance education and also that every course can be taken from everywhere through distance education. Besides, it can be said that some of the students have not internalized distance education yet.

Learned from Distance Education Implementation

Table 12. Content Analysis of the Opinions of Gifted Students about the Learned from Distance Education Implementation

Theme	Codes	Students	f	%
Learned from Distance Education Implementation	Astronomy	s2,s3,s5,s6,s11, s23,s26,s28,s37, s38,s39	11	27,5
	Acquiring new knowledge	s1,s7,s10,s14,s16, s21,s25,s29,s40	9	22,5
	Learning Thinking Skills	s2,s4,s5,s11,s15, s22,s26,s28	8	20
	Learning to code and build circuits	s3,s6,s9,s11,s23, s26,s28,s34	8	20
	Learning brain teasers	s2,s3,s6,s9,s37,s39	6	15
	Learning additional information	s13,s17,s19,s30,s32	5	12,5
	Math with Origami	s3,s9,s23	3	7,5

When Table 12 is analysed, "What kind of information have you learnt from these training you received through distance education process? ", 27.5% of the students answered that they Astronomy; 22.5% acquiring new knowledge; 20% learning to code and build circuits; 20% Learning Thinking Skills; 15% learning brain teasers; 12.5% learning additional information and 7.5% Math with Origami. Within this information, it can be interpreted that the majority of the students learnt new and different information in Astronomy, Robotic Coding and Thinking Skills courses. In addition, while it can be interpreted that they acquired new and different information at the same rate in the Robotic Coding and Thinking Skills courses, it can be interpreted that a small number of students acquired new and different information in Origami and Mathematics courses. This situation can be interpreted as the students could not get used to learning Mathematics with Origami. In general, it can be stated that students learnt new information from the education they received.

Opportunity to Take Lessons with Distance Education

Table 13. Content Analysis of the Opinions of Gifted Students about the Opportunity to Take Lessons with Distance Education

	Codes	Students	f	%
Opportunity to Take Lessons with Distance Education	Receiving education from different SAC	s1, s2, s4,s5,s6, s7,s8,s10,s14, s17,s20, s21,s22, s23,s24,s26,s28,s30,s31,s32,s33, s34, s39,s40	24	60
	Receiving different training	s3,s11,s16,s19,s35, s36,s37	7	17,5
	Face to face preference	s12,s13,s18,s25, s27,s38	6	15

When Table 13 is examined, "What do you think about being able to receive a training you need (a training that is not available in your own SAC) through distance education if the opportunity is offered?" 60% receiving education from different SAC; 17.5% said that Receiving different training and 15% said receive face-to-face. Within this information, it can be interpreted that students are very willing to receive training that is not available in their own SACs through distance education and that different pieces of training can be received through distance education.

Distance Education or Face to Face Education Preference

Table 14. Content Analysis of the Opinions of Gifted Students about the Distance Education or Face to Face Education Preference

Theme	Codes	Students	f	%
Distance Education or Face to Face Education Preference	Face to face preference	s1,s2,s4,s5,s6, s7,s8,s9,s10,s11,s12,s13,s14,s15,s16, s17,s18,s19,s20,s21, s22,s23,s24,s25,s26, s27, s28, s29,s30,s31, s32,s33,s34,s35,s37, s38,s39,s40	38	95
	Remote preference	s3,s36	2	5

When Table 14 is examined, "If you want to take these pieces of training that you have received through the distance education process again, would you prefer to take them with distance education or normal (face-to-face) education?" 95% of the students answered face-to-face, while 5% answered that they remote preference. Within this information, it can be interpreted that the courses given by distance education would be more useful if they were given face-to-face. It is thought that the COVID-19 pandemic and its reflections on the education process have a great impact on this result.

In Yadigar's (2010) study on "evaluation of the effectiveness of distance education programmes", students were asked which type of programme they would prefer if they wanted to receive another education in the future, and the majority of students stated that they would prefer a distance education programme if they wanted to receive another education in the future.

Recommendations for the Efficiency of Distance Education

Table 15. Content Analysis of the Opinions of Gifted Students about the Recommendations for the Efficiency of Distance Education

	Codes	Students	f	%
Recommendations for the Efficiency of Distance Education	Extension of the duration	s1,s4,s5,s6,s16, s19,s21,s28,s37	9	22,5
	Internet and technical problem solving	s12,s14,s25,s33, s36, s38,s40	7	17,5
	More activities	s3,s8,s9,s30,s34,	5	12,5
	Private platform (such as EBA)	s13,s17,s32	3	7,5

When Table 15 is analysed, to the question "What do you think can be done to make distance education courses more efficient?", 22,5% of the students answered extension of the duration; 17,5% answered that internet and technical problem solving; 12,5% answered that more activities and 7,5% she replied that a special platform such as the Education Information Network (EBA) can be created. Within this information, it can be interpreted that the majority of the students complain about the limited duration of the courses and the technical problems experienced especially in distance education. Again, it can be interpreted that students want to do more activities with distance education by establishing a special platform. If course durations are extended and activities can be diversified, it can be stated that students' perspectives towards distance education may be different. Especially with the compulsory transition to distance education after the Covid-19 pandemic, it can be interpreted that in the first stage, students had connection problems in the process of getting used to distance education, they spent some of their time connecting to the system due to the limited course duration, and this was reflected in the students' responses.

Although there were no technical problems during the application, the fact that the students mentioned technical problems can be interpreted that they reflected the problems they experienced in distance education outside our application to the study. In a study conducted by Satıcı et al. (2020), students complained that there was not enough time in the coding sections due to the insufficient course hours (60 minutes for all courses) in the programming course conducted by distance education. In a study conducted by Salman et al. (2021), it was concluded that the average difficulties encountered by students in distance education were high and that technical problems in the internet and distance education platforms made students uneasy. Veletsianos et al. (2021) concluded that the time commitments required for students to be successful in distance education courses should be prepared according to realistic understandings. Delcker and Ifenthaler (2020), in their study, concluded that the information technology infrastructure in many schools did not work, and the existing technological equipment is not suitable for distance education. Handel et al. (2020) revealed in their studies that students who were not ready for online distance education had to deal with two kinds of problems. The first was the lack of equipment to participate in online distance education, and the second was that they suffered from stress-related emotions and loneliness.

Advantages of Distance Education

Table 16. Content Analysis of the Opinions of Gifted Students about the Advantages of Distance Education

Theme	Codes	Students	f	%
Advantages of Distance Education	No advantage	s1,s2,s6,s11,s12, s18,s25,s28,s31	9	22,5
	Independence of time and space	s3,s4,s7,s13,s17, s24,s36,s39,s40	9	22,5
	Health	s14,s15,s21,s30,s33	5	12,5
	Freedom to choose education	s10,s16,s26,s32	4	10

In Table 16, "What are the advantages of distance education compared to face-to-face education?" 22.5% of the students answer the question independence of time and space; 12.5% health; 10% freedom to choose education; 22.5% answer that there is no advantage. Within this information, while most students find it advantageous in terms of time and place independence, health and getting the education they want, it can be interpreted that some do not see distance education as beneficial. Since the application was made during the COVID-19 pandemic, which emerged at the end of 2019 and affected the whole world, it can be interpreted that students consider distance education advantageous as an escape from the COVID-19 pandemic. In addition, it can be stated that the risk of transmission of the COVID-19 pandemic is high; students care about their health and see distance education as an advantage to stay away from the pandemic. In their study, Ewing and Cooper (2021) concluded that most students found distance online learning less personalized and quite challenging. Erümit (2020), on the other hand, stated in his study that students' views on simultaneous remote lessons were largely positive as they provided advantages such as social interactions, motivation and asking questions. In Leontyeva's (2018) study, students emphasized both advantages and disadvantages in the quality of distance education: 85.14% of students stated the existence of distance education as an advantage, and any electronic course could be learned anywhere with any electronic device with the internet access. Furthermore, almost all participants drew attention to the opportunity to improve themselves (89.7%) and save their spare time (80.9%). In addition, 57.01% of the participants stated that their anxiety decreased while performing control tasks (e.g., tests, credit tests), and the main shortcomings (disadvantages) of distance education were the lack of full-fledged communication with teachers and other students (about 44%), the lack of necessary skills to use computer-based online learning systems (57.9%), and parents' critical attitude towards such activities (39,7%). In their study, Lee et al. (2021) concluded that technology-related problems decreased rapidly after obtaining initial access and adaptation to online learning environments. Moreover, most students highlighted that they found online learning accessible (no technical and internet problems) positive and commented as follows: "I had the opportunity to access it from anywhere there was the internet, and it was quite productive"; "it was very convenient that I could arrange my learning time"; and "I really preferred the online course, I had a chance to watch the course and the videos multiple times whenever I wanted."

Disadvantages of Distance Education

Table 17. Content Analysis of the Opinions of Gifted Students about the Disdvantages of Distance Education

Theme	Codes	Students	f	%
Disadvantages of Distance Education	Connection difficulty	s3,s7,s9,s12,s13, s16,s19,s20,s21,s28,s32,s38	12	30
	Causing health problems	s14,s31,s33,s39	4	10
	Inefficient	s11,s26,s35,s40	4	10
	Difficulty of mutual communication	s18,s24,s37	3	7,5

As represented in Table 17, "What are the disadvantages of distance education compared to face-to-face education?" 30% of students connection difficulty; 10% highlighted that causing health problems; 10% emphasized its inefficiency, and 7.5% answered that difficulty of mutual communication. Within this information, it can be interpreted that most students have difficulties accessing and communicating in distance education and complain about various health problems. In addition, the impact of the COVID-19 pandemic has crucial effects on students in seeing distance

education as a disadvantage as it causes health problems and as an advantage for escaping from the COVID-19 pandemic. Students see distance education as a disadvantage because it causes health problems such as being in front of the screen for a long time, muscle stiffness, eye discomfort and joint pain; hence, it can be indicated that they see distance education as an advantage to escape from the COVID-19 pandemic and stay away from the pandemic. Lee et al. (2021) concluded in a study that one of the negative aspects of distance online learning was the lack of peer-to-peer interaction (socialization). In addition, students stated that it was difficult to "communicate with other students" and "make new friends". Ewing et al. (2021) revealed in their study that social isolation was a great challenge for students.

Conclusion

With the COVID-19 pandemic, the concept of distance education has started to be heard frequently, and it has been realized how vital it is. In this study, carried out with gifted students in SACs through distance education, it was thought that awareness of distance education would be created in SACs. The research findings were discussed from the perspective of students and parents, and the results are given below.

Before the research, the distance education online learning expectations form was applied to the students, and their views on distance education were taken. After the application, the same form was applied again, and it was concluded that the students' views changed positively after the training.

With the same form, the students' views were also taken based on their education in SAC, and their achievement scores were examined after the application. It was concluded that there was a significant difference in their opinions.

In the form in which the researchers analyzed whether the parents' views differed significantly or not according to their education level, it was concluded that the parents' opinions differed significantly in some items and did not differ in others. For the item "I would like my child to receive the education they need, which is not in Science and Art Center through distance education," significant differences were found between secondary school and primary school; university and primary school; university and high school. For the item "I would like my child to take lessons from teachers in different SACs through distance education," it was concluded that there was a significant difference between university and secondary school.

In the form in which students' opinions were taken after the teaching practices, they were asked whether the training they received through the distance education process was beneficial or not. It was concluded that the training was beneficial, and the students learned new information about various fields.

Students who were asked about their opinions about taking the courses they did not take due to various reasons such as not being available in their SACs, transportation problems, physical disability of the individual through distance education. It was concluded that they were very willing to take some courses through distance education and thought every class could be handled this way. However, it was concluded that some students did not get used to distance education. Students were also asked about their opinions on taking the courses they needed that were unavailable in their SAC through distance education if the opportunity was offered again. It was concluded that most of the students were willing to take them.

Students were asked whether they would like face-to-face education or distance education if they wanted to take these courses that they took through distance education again. It was concluded that the majority of the students would prefer face-to-face teaching. At this point, it was understood from the contradiction that the COVID-19 pandemic and all its reflections on education affected the students' answers.

It was concluded that most of the students who were asked opinions about how to make distance education more efficient complained about the short duration of the lessons and the technical problems experienced during the lessons.

It was concluded that most of the students, who were asked about the advantages and disadvantages of distance education, found distance education advantageous in protecting their health (escaping from the COVID-19), taking the courses they wanted and being independent of time and space. However, some students thought otherwise. It was concluded that most students had difficulties accessing and communicating in distance education, and some had health problems like eye and muscle pain. When these results were examined, it was thought that current issues related to

distance education were under the effect of the COVID-19 pandemic since students actually did not experience any communication and access problems during the practices.

In this study, Astronomy, Thinking Skills, Origami and Mathematic, Values Education, Robotic Coding and Intelligence Games courses were taken by the students who were studying at Science and Art Centers in Kars and Ardahan. At the end of the teaching practices, the opinions of students and parents about the courses were tried to be interpreted. As the internet is taking a prominent place in our lives, a new era has started in distance education. Many public institutions and private sectors in the education sector have begun to provide distance courses. In this way, the concept of time and place in education has disappeared, and individuals have been given the opportunity to receive these courses wherever and whenever they want. Since distance education has become widespread today, institutions and organizations will support lifelong learning while creating content if they develop programs aimed at meeting the interests and needs of individuals and the skills required by the age. It is essential for the future of our country that the gifted students who receive education in SACs reach the educational outcome they need. It is necessary to meet the needs of gifted students in SACs with courses covering the skills required by the age to prevent the talents of these individuals from atrophying, and it is thought that distance education can be an alternative for the solution to this problem. So, they can take the courses they need from the academicians at universities and teachers in SACs. The importance of distance education has emerged with the effects of the Covid-19 pandemic and its aftermath, and this process has revealed the necessity of giving more place to distance education qualitatively and quantitatively. In the digitalized world, it is obvious that distance education will not be temporary and will take more place in our lives, and in this context, it is thought that particular importance should be given to distance education in SACs.

Recommendations

- In other studies, more in-depth research on distance education can be conducted by taking the opinions of teachers working in SACs.
- It is suggested that by doing a similar study in other SACs, the observations of the teachers who teach with distance education about their students can be analyzed.
- It is suggested that since the results of this study were under the effect of the Covid-19 pandemic, a similar study can be repeated in the future and the results can be reinterpreted.
- It is suggested that the results of a similar study can be evaluated by conducting the analysis on different courses in other SACs.
- The results of this study were obtained by interpreting the data obtained from gifted students in SACs, and a similar study can be conducted with specially gifted students in SACs and the results can be interpreted.
- It is suggested that training can be given by creating special platforms (such as EBA) in studies to be carried out with distance education and the results can be evaluated.
- In other studies, research can be conducted on what kind of advantages distance education has in terms of health.

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Appendix 1.

Distance Education Online Learning Expectations Form

Distance Education Online Learning Expectations Form

Dear students, This form has been developed for scientific research and the opinions you express in the form will only be used for scientific research and your answers will not be shared with anyone in secret. It is important for our research that you sincerely answer the items in the form and give your real opinions. Read each item carefully and select the option that suits you best. Please take care to answer all items. Thank you very much for your contributions to the research.

Type of school studied
☐ Public school
☐ Private school

BILSEM where training is taken
☐ KARS / CENTER - Fahrettin Kırzıoğlu Science and Art Center
☐ ARDAHAN / CENTER - Ardahan Science and Art Center
☐ IĞDIR / CENTER - Iğdır Science and Art Center

Gender
☐ Girls ☐Boys

Age
☐ 10 ☐11 ☐12

Item No.	Distance Education Online Learning Expectations Form Items	I Strongly Agree	Agree	I'm undecided	Disagree	I strongly disagree
1	I prefer distance learning to face-to-face					
2	I would like to receive some trainings that I want to receive but cannot get with distance education.					
3	I think distance education is useful					
4	I think I will learn better with distance education					
5	I think distance education will increase my success in my courses					
6	I think that distance education will offer equal education opportunities to everyone.					
7	If I take my classes by distance learning, I feel much more comfortable (there is no pressure on me)					
8	Distance learning allows me to express myself better in classes					
9	I think distance education is a suitable alternative for the trainings I need.					
10	I think distance education is more effective than face-to-face education					

Appendix 2. Distance Education Self-Assessment Form

Distance Education Self-Assessment Form
Dear students, This form has been developed for scientific research and the opinions you express in the form will only be used for scientific research and your answers will not be shared with anyone in secret. It is important for our research that you sincerely answer the items in the form and give your real opinions. Read each item carefully and select the option that suits you best. Please take care to answer all items. Thank you very much for your contributions to the research.
Type of school studied ☐ Public school ☐ Private school
BILSEM where training is taken ☐ KARS / CENTER - Fahrettin Kırzıoğlu Science and Art Center ☐ ARDAHAN / CENTER - Ardahan Science and Art Center ☐ IĞDIR / CENTER - Iğdır Science and Art Center
Gender ☐ Girls ☐Boys
Age ☐ 10 ☐11 ☐12
Class ☐ 5th class ☐ 6th grade
Distance Education Self-Assessment Form Items Important Note: When answering the articles, only answer by considering the lessons you have learned within this scientific research.
1) What do you think about the usefulness of these trainings you have received through the distance education process?
2) What do you think about the possibility of receiving an education that you want to receive but cannot get with distance education?
3) What kind of information did you learn from these trainings you received through the distance education process?
4) If you are given the opportunity, what do you think about being able to receive an education you need (an education that is not in your own BILSEM) with distance education?
5) If you want to take these trainings you have received through the distance education process again, would you prefer to take them with distance education or normal (face-to-face) education?
6) What do you think can be done to make the courses given by distance education more efficient?
7) In your opinion, what are the advantages of distance education compared to face-to-face education?
8) In your opinion, what are the disadvantages of distance education compared to face-to-face education?

Appendix 3. Distance Education Parent Evaluation Form

Distance Education Parent Evaluation Form

Dear parents, This form has been developed for scientific research and the opinions you express in the form will only be used for scientific research and your answers will not be shared with anyone in secret. It is important for our research that you sincerely answer the items in the form and give your real opinions. Read each item carefully and select the option that suits you best. Please take care to answer all items. Thank you very much for your contributions to the research.

BİLSEM where the student is trained
☐ KARS / CENTER - Fahrettin Kırzıoğlu Science and Art Center
☐ ARDAHAN / CENTER - Ardahan Science and Art Center
☐ IĞDIR / CENTER - Iğdır Science and Art Center

Gender
☐ Mrs. ☐Miss

Your Age
☐ 25 and under ☐ 26-35 ☐ 36-45 ☐ 46 and above

Your level of education
☐ Primary School ☐ Middle School ☐ High School ☐ University ☐ Graduate

Item No.	Distance Education Parent Evaluation Form Items	I Strongly Agree	Agree	I'm undecided	Disagree	I strongly disagree
1	I want my child to receive an education he needs (which is not in BILSEM) through distance education.					
2	I want my child to take lessons from teachers in different BILSEMs via distance education.					
3	I want my child to take distance learning courses from academics at universities					
4	I think distance learning will meet my child's educational needs					
5	I think that distance education is a suitable alternative for the trainings that my child may need					