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Research Article

Turkish gifted students' interests of courses and inclations of the talent fields: Example of Science and Art Centers[1]

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Abstract

This study is carried out within the scope of aim to determine the areas and courses of interest of gifted and talented students, using a survey research model among quantitative research design. Within this scope, data was obtained from 370 gifted students using stratified purposive sampling method with electronic forms created in two parts via Microsoft Forms. Data analysis was carried out with SPSS 22 packet data analysis program. Descriptive statistics and difference tests were utilized in the analysis of the data. As a result of the study, it was found that gifted and talented students are most interested in courses of chemistry, informatics and mathematics while courses of history, literature and philosophy were the least favored. Other findings of the study are significant differences in course interest of gifted childrenobtained according to the variables of gender, duration of education in SAC, type of identification area in SAC and type of program in SAC.

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Introduction

The education of gifted and talented students is seen as necessary with respect to both individual and social priorities (Sak, 2014). Each person has the right to request education in accordance with their individual differences (Clark, 2013). In addition, it is necessary to take educational measures to transform the existing potential of gifted children, which are considered one of the most important and great resources of societies, into performance at the highest level (Davis et al., 2011; NAGC, 2006). Societies greatly benefit from advanced development of all kinds of skills and abilities of its members, regardless of the field they are in. Things that nurture and help develop the individual also nurture the society (Clark, 2013).

Contributions to society in all areas by means of human effort largely come from gifted and talented people (Clark, 2013; Dai, 2010; Davis et al., 2011). To perform complex and innovative tasks that are much more than what is expected from normal people, the society needs gifted and talented people (Dai & Chen, 2014). We need a large number of integrated and hardworking people to fulfill the tasks that will lead us to a fulfilling and well-established future (Clark, 2013). The Education of gifted and talented individuals can produce programs and experiences so that gifted and talented individuals can better meet both their own needs and the needs of society (Dai & Chen, 2014). Talent training

1 These institutions (Science and Art Centers) are the institutions that provide support education to gifted children in Turkey.

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can provide awareness for people who require more nurture for their unique fields of talent in order to become aware of their potential (Davis et al., 2011).

Education of the Gifted and Talented: Science and Art Center

Gifted and talented students who demonstrate advanced characteristics compared to their peers have different educational needs (Renzulli & Reis, 1997). Special training is required to meet these educational needs (Dai & Chen, 2014). In addition to very few private intitutions in Turkey, the Science and Arts Centers (SAC) affiliated to Ministry of National Education are in service for gifted and talented individuals. As of 2021, 182 SAC centers (MNE, 2020) serve in each provincial center and in major districts in accordance with the principles of Special Education Services Regulation n.30471 signed on 07.07.2018 and the directive of Science and Arts Centers published in December 2019. According to annual SAC student identification guidelines; 1st, 2nd and 3rd grade primary schoolers are nominated and applied to programs by their teachers on two fields at most: painting, music and general intellectual abilities. Nominated students are taken to the Group Scanning Application done in centers via tablet computers. From the group of students who are successful in Group Scanning Application, those who were applied in fields of painting and music for their abilities are evaluated individually in their respective fields in commissions, and those who were applied for their intellectual abilities are taken to intelligence testing in Counseling and Research Centers. Those who succeed in individual assessments and intelligence tests in commissions at this stage are entitled to register to SAC without quota restrictions. After completing this process in several months', winning students are enrolled to SAC at the beginning of the next academic year on their 2nd, 3rd or 4th grade in education (MNE, 2019a).

SAC students continue their formal education with their peers while recognizing their individual abilities and improve upon them to realize their potential in accordance with SAC educational programmes. Education and training activities to be held in SAC are planned to not coincide with students' formal education hours on weekdays and/or on weekends. Students enrolled in SAC are taken into the programs of orientation, supportive program, individual talent recognition program (ITRP), special talent discovery program (STRP), and project development (MNE, 2019b). SAC programme steps and descriptions are featured in Table 1 (MNE, 2019b).

Table 1. SAC's educational program stages and descriptions

Program Stages	Program Description
Orientation Program	Educational programconducted to learn about the social and psychological development of students who have recently enrolled in SAC and to introduce SAC to these students.
Supportive Program (SP)	Educational program conducted by associating students, identified with the field of intellectual ability, with all fields/disciplines.
Individual Talent Recognition Program (ITRP)	Educational program that is conducted for students who are identified with the field of general intellectual ability and who have completed the support training program to become aware of their individual abilities.
Special Talent Discovery Program (STRP)	Education program that is conducted to improve the special abilities of students from the ability field of musical and visual arts who completed the orientation program, and students from the ability field of general intellectual abilities who completed individual talent recognition program.
Project	Educational program that students undergo individually or with a group under the guidance of a consultant teacher in a field/discipline in accordance with their interests, desires and abilities.

Educational programs to be applied in SAC are student-centered and interdisciplinary. They are conducted under the guidance of leading/consultant teachers in accordance with individual education in a way to allow students to acquire top-level cognitive, social, personal and academic skills such as effective problem solving, decision making, and creativity. The aim is to improve students as individuals who learn by applying, participating in production, solving problem, thinking uniquely, communicating effectively and researching scientifically (MNE, 2019b).

Characteristics and Interests of Gifted and Talented Students

Gifted and talented students have special characteristics and interests (Brown & Stambaugh, 2014). Those who work with gifted and talented stutents must consider both their needs and their characteristics (NAGC, 2012). In other words, it is necessary for educators, families and managers to learn about the characteristics and educational needs of gifted and talented students. Meeting these needs and developing appropriate educational strategies for the gifted and talented is essential (Nellis & Gridley, 2000). Due to different developmental characteristics and different interests of gifted and talented children, certain changes to educational programmes must be made (Brigham & Bakken, 2014; Renkin, 2016; Renzulli & Reis, 1997). As a result, gifted and talented children who are educated in the best way possible will make great contributions to both themselves and society (Clark, 2013).

Gifted and talented students are often bored by repetitiveness, routines that don't meet their needs and absence of response to their expectations (Renkin, 2016). Developing and implementing educational experiences that support the gifted and talented individuals' interests should be considered as a requirement of their needs and characteristics (Meador, 1996). Because of this, a collaborative approach to planning, implementing and evaluating education should be conducted between families and teaching staff (Kennedy, 2002). Teachers, field experts, peers, families and consultants should play a role in the educational processes of gifted and talented children (Clark, 2013).

By developing and supporting education suitable for gifted students, these students can continuously improve to their full potential (Tomlinson, 2005). As a result of supporting and developing their abilities, these students will be able to increase their potential to the highest possible level (Renzulli, 2005). Educators can ensure that gifted and talented students improve the level and scope of their abilities (Kelemen, 2020). Programmes that aim to improve abilties in gifted and talented students' education should provide learning experiences that will present challenging tasks in students' areas of interest from an early age (Brown & Stambaugh, 2014).

When the needs of gifted and talented students are defined and the educational programme is designed to meet these needs, students attain significant achievements and develop their perception of competence (Ford, 2011). Gifted and talented students have the ability to work on a topic of interest in detail with great focus for a long time (Clark, 2013). Firstly determining their interests,abilities, and skills stand out during the creation phase of the processes that will help gifted and talented students in their educational processes (Kaplan, 2005). In order to learn about gifted and talented students and work on developing their abilities, be it at home or at school, we first need to explore their abilities and interests (Clark, 2013; Kelemen, 2020). Results of these findings will also help us create opportunities to develop their abilities, interests and skills to the highest levels.

If we consider giftedness as an innate gift and an opportunity for success, it should be taken into account that this potential success can disappear when appropriate conditions such as environmental stimulants or correct educational regulations are not established (Reis & McCoach, 2000). Considering the developmental characteristics of gifted and talented children, not receiving much needed support may result in negative emotional impact (Clark, 2013). At the same time gifted and talented children unable to demonstrate sufficient motivation can also be observed (Clark, 2013; Davis et al., 2011). Children need to have a sufficient level of desire and interest to excel in their fields of ability (Renzulli, 2005). Gifted and talented children can show intense motivation by concentrating their abilities on their interests (Davis et al., 2011). Because the needs and interests play an important role in motivation, arrangements to motivate gifted and talented children must be related directly or indirectly to their needs and interests (Renzulli, 2005). Teachers must show gifted and talented children new goals in their fields of skill (Brown & Stambaugh, 2014). Gifted and talented children should be supported by motivating them in relation to these new goals.

The Current Study

Gifted and talented people need a high level of intellectual stimulation, rapid learning and interpretation of complex information, researching the topic they are given in depth, and constantly questioning and examining it (Kim et al., 2013). In order to meet these requirements, they need to be offered opportunities and environments where they can demonstrate and develop their interests and abilities and work in flexible and creative organizations (Koshy, 2002). In order to provide appropriate learning experiences to advance gifted and talented children to the next level, it is necessary

to know their current level, what abilities they possess and their topics and fields of interest (Colangelo & Davis, 2003). In this context, the study of the areas, and courses of interest of gifted and talented students studying in Science and Arts Centers constitutes the problem of the research. The variability of students' interest levels depending on types of courses and subjects in terms of demographic characteristics of the students was also examined in this study.

Method

This study is carried out in the survey research model among quantitative research patterns in order to determine the gifted students' interests in the subject fields. Survey research aims to identify certain characteristics or situations belonging to a group, such as skills, attitudes and ideas (Fraenkel et al., 2012).

Participants

Population of this study included 57.360 gifted and talented students in 182 official Science and Arts Centers affiliated to Ministry of National Education of Turkey (MNE, 2020). From these centers, data were obtained from 370 gifted students studying in 12 different SAC centers using stratified purposive sampling method. Descriptive information for the students involved in the study is included in Table 2. The sample consists of %53.1 (n=197) female and %46.8 (n=173) male, 370 students in total. SAC Centers students were enrolled in, SAC programme steps, diagnostic areas, how long they were in SAC, and their school grades out of SAC were described in Table 2.

Table 2. Descriptive informations of participants

Variable		**N**	**%**
Gender	Female	197	53.2
	Male	173	46.8
Type of Diognostic*	IT	308	83.2
	VAT	33	8.9
	IT and VAT	14	3.7
	IT and MT	9	2.4
	MT	3	.8
	IT, VAT and MT	2	.5
	VAT and MT	1	.2
Program Stages	ITRP-1	144	38.9
	ITRP-2	43	11.6
	SP-1	14	3.8
	SP-2	91	24.6
	STRP-1	27	7.3
	STRP-2	10	2.7
	STRP-Music	4	1.1
	STRP-Painting	27	7.3
	Project	10	2.7
Duration of Education in SAC	1 year	1	.3
	2 years	180	48.6
	3 years	82	22.2
	4 years	70	18.9
	5 years	24	6.5
	6 years	6	1.6
	7 years	4	1.1
	8 years	1	.3
	10 years and above	2	.5
Grade	3rd grade	17	4.6
	4th grade	85	23.0
	5th grade	188	50.8
	6th grade	41	11.1
	7th grade	16	4.3
	8th grade	8	2.2
	High School Preparatory Grade	1	.3
	High School First Grade	4	1.1

	High School Second Grade	4	1.1
	High School Third Grade	4	1.1
	High School Fourth Grade	2	.5
	Total	370	100.0

IT: Intellectual Talent **VAT:** Visual Art Talent **MT:** Musical Talent **SP:** Supportive Program **ITRP:** Individual Talent Recognition Program **STRP:** Special Talent Discovery Program

Twelve regions have been established in Turkey, taking into account functional relations between provinces, geographical conditions, suitability for the purpose of collecting statistics and making plans (NUTS12: The Nomenclature of Territorial Units for Statistics; MNE, 2020). According to the online form NUTS12 prepared within the scope of the study, 12 provinces with a high population density and not adjacent to each other were selected and all 5,969 gifted and talented students studying in official Science and Arts Centers in these provinces were forwarded a Microsoft Forms link. 370 of these students have returned the forms by filling them out on online platforms. The distribution of the selected regions, and provinces, is shown in Table 3.

Table 3. Distribution of selected provinces according to NUTS12

NUTS12 Region	Provinces	SAC Name	Total Students	N	%
Istanbul	İstanbul	Başakşehir Sezai Karakoç	411	14	3.4
West Marmara	Edirne	Şehit Nefize Çetin Özsoy	283	36	12.7
Aegean	Manisa	Manisa/Şehzadeler	591	34	5.7
East Marmara	Düzce	Düzce/Merkez	296	26	8.7
West Anatolia	Konya	Konya/Meram	627	49	7.8
Mediterranean	Adana	Adana/Çukurova	904	53	5.8
Central Anatolia	Kayseri	Çetin Şen	698	42	6
West Black Sea	Amasya	Şehit Ferhat Ünelli	261	11	4.2
East Black Sea	Trabzon	Faruk Başaran	550	19	3.4
Northeast Anatolia	Erzurum	Remzi Sakaoğlu	375	27	7.2
Central East Anatolia	Malatya	Malatya/Yeşilyurt	657	47	7.1
Southeast Anatolia	Gaziantep	Nuray Tuncay Kara	316	12	3.7
Total			5.969	370	6.1

Data Collection Tools

Data were obtained by researchers using two-section electronic forms created via Microsoft Forms. In the first part of the form, there are 7 questions prepared by researchers aimed at determining the demographic characteristics of SAC students. In the second part of the form, there is a total of 100 items of "Course Interest Battery for Gifted and Talented Students" consisting of 10 sub-dimensions in 5 point likert type scale format. This scale was developed by Bakan (2019) and its validity and reliability studies were carried out. As a result of factorial analysis, it is seen that a 10-factor structure appears in this measurement instrument (Bakan, 2019). Consisting of 100 items named as Mathematics, Physics, Chemistry, Biology, Literature, History, Geography, Philosophy, Informatics and English, the structure covers 67.59% of the total variance (Bakan, 2019). When the Course Interest Battery for Gifted and Talented Students items are examined on the factor loadings, History subscale gives a value between .76 and .84; Informatics subscale gives a value between .79 and .85; Philosophy subscale gives a value between .71 and .83; Biology subscale gives a value between .65 and .81; Physics subscale gives a value between .67 and .81; Chemistry subscale gives a value between .68 and .80; English subscale gives a value between .71 and .86; Mathematics subscale gives a value between .69 and .84 ; Literature subscale gives a value between .57 and .81; and Geography subscale gives a value between .65 and .74 (Bakan, 2019). In the context of these values, according to the evaluation of the course interest battery for gifted and talented students, 2 items can be qualified as good, 17 items as very good, and the remaining 81 items as excellent. In addition, when looking at the

reliability of the subscales in the analysis conducted to test the reliability of the scale, Cronbach's Alpha values vary between values of .92 and .95. As a result of the analyses, Course Interest Battery for Gifted and Talented Students developed by Bakan (2019) scale is shown to be valid and reliable for measurement of interest of gifted and talented children in the fields of Mathematics, Physics, Chemistry, Biology, Literature, History, Geography, Philosophy, English and Informatics.

Procedure

During research process, before field work, University Ethics Committee ethical approvement no. E-29563864-050-04.04-26100 dated 24.02.2021 and Ministry of National Education research approval no. E-27250534-605.01-23496788 dated 01.04.2021 were acquired. Then, a total of 12 different SAC were determined from each of the 12 different regions predetermined by NUTS12. The managers of these SAC Centers were reached out to and were informed about the study and the received permission forms were transmitted. Directors of the institutions shared the Microsoft Forms link prepared by researchers with their students in online environments. Under voluntary participation, 370 students from 12 different SAC Centers filled out the forms sent as links.

Data Analysis

Analysis of the data was done via SPSS 22 packet data analysis program. Descriptive statistics and difference tests were utilized during the analysis of the data. Table 4 shows the average scores, standard deviations, skewness and kurtosis values of students who continue to attend SAC.

Results

Results obtained from data analysis are shown in this segment. First descriptive statistics and then difference statistics are included in the table.

Table 4. Descriptive statistical results of subscales of course interest inventory for gifted and talented students

Courses	N	$\bar{X}$	Sd	Skewness	Std. Error of	Kurtosis	Std. Error	Min	Max
Mathematicss	370	39.35	9.854	-0.932	.127	0.214	.253	10	50
Physics	370	35.91	9.240	-0.335	0.127	-0.663	0.253	10	50
Chemistry	370	40.51	7.873	-0.879	0.127	0.369	0.253	13	50
Biology	370	37.73	8.921	-0.627	0.127	-0.268	0.253	10	50
Literature	370	31.62	9.120	0.051	0.127	-0.675	0.253	10	50
History	370	30.83	9.419	0.07	0.127	-0.651	0.253	10	50
Geography	370	35.80	8.339	0.443	0.127	-0.07	0.253	10	50
Philosophy	370	32.10	8.645	0.07	0.127	-0.638	0.253	10	50
Infomatics	370	39.63	10.234	-0.952	0.127	0.052	0.253	10	50
English	370	38.28	10.132	-0.828	0.127	-0.052	0.253	10	50

Upon examination, Table 4 reveals that courses students most interested in are the following in order: chemistry ($\bar{X}$=40.51, Sd=7.873), informatics ($\bar{X}$=39.63, Sd=10.234) and mathematics ($\bar{X}$=39.35, Sd=9.854). In contrast, courses students least interested in are the following in order: history ($\bar{X}$=30.83, Sd=9.149), Literature ($\bar{X}$=31.62, Sd=9.120), and philosophy ($\bar{X}$=32.10, Sd=8.645). In order to determine depending on which variables scores that students received from the course interest battery have changed, independent samples t-test was performed on two-categorical variables. Results of the analysis are shown on Table 5.

Table 5. Results of independent samples t-test obtained from the scale scores according to variables gender, identification field, and number of years of attending to SAC

Courses	Variables	Groups	N	$\bar{X}$	Sd	t	p
Mathematic	Gender	Female	197	39.05	9.679	-.609	.543
		Male	173	39.68	10.069		
	Diognastic	Intellectual	333	39.64	9.886	1.726	.085
		Other	37	36.70	9.276		
	Duration	First 2 years	181	39.75	9.445	.769	.442
		3 years and above	189	38.96	10.241		
Physics	Gender	Female	197	34.92	8.989	-2.210	.028*

		Male	173	37.04	9.417		
	Diognastic	Intellectual	333	36.34	9.159	2.701	.007**
		Other	37	32.05	9.189		
	Duration	First 2 years	181	36.41	8.990	1.009	.314
		3 years and above	189	35.44	9.473		
Chemistry	Gender	Female	197	40.18	7.719	-.862	.389
		Male	173	40.89	8.050		
	Diognastic	Intellectual	333	40.97	7.737	3.370	.001**
		Other	37	36.43	8.009		
	Duration	First 2 years	181	41.16	7.419	1.549	.122
		3 years and above	189	39.89	8.256		
Biology	Gender	Female	197	38.31	8.385	1.336	.182
		Male	173	37.07	9.475		
	Diognastic	Intellectual	333	38.07	8.920	2.207	.028*
		Other	37	34.67	8.443		
	Duration	First 2 years	181	38.72	8.219	2.095	.037*
		3 years and above	189	36.78	9.469		
Literature	Gender	Female	197	35.00	8.369	8.277	.000**
		Male	173	27.77	8.402		
	Diognastic	Intellectual	333	31.32	9.187	-1.909	.057
		Other	37	34.32	8.104		
	Duration	First 2 years	181	32.06	8.521	.912	.362
		3 years and above	189	31.20	9.661		
History	Gender	Female	197	30.37	9.275	-1.012	.312
		Male	173	31.36	9.580		
	Diognastic	Intellectual	333	31.03	9.491	1.213	.226
		Other	37	29.05	8.666		
	Duration	First 2 years	181	31.62	9.012	1.580	.115
		3 years and above	189	30.08	9.757		
Geograph	Gender	Female	197	35.99	7.635	.486	.627
		Male	173	35.57	9.093		
	Diognastic	Intellectual	333	35.94	8.426	1.029	.304
		Other	37	34.46	7.485		
	Duration	First 2 years	181	36.58	7.418	1.785	.075
		3 years and above	189	35.04	9.090		
Philosophy	Gender	Female	197	33.81	7.815	4.148	.000**
		Male	173	30.15	9.142		
	Diognastic	Intellectual	333	32.15	8.819	.352	.725
		Other	37	31.62	6.966		
	Duration	First 2 years	181	32.75	8.603	1.426	.155
		3 years and above	189	31.47	8.661		
Infomatics	Gender	Female	197	36.45	10.721	-6.760	.000**
		Male	173	43.25	8.298		
	Diognastic	Intellectual	333	40.19	10.007	3.176	.002**
		Other	37	34.62	11.013		
	Duration	First 2 years	181	41.32	8.964	3.147	.002**
		3 years and above	189	38.01	11.101		
English	Gender	Female	197	39.61	9.200	2.735	.007
		Male	173	36.75	10.927		
	Diognastic	Intellectual	333	38.17	10.230	-.612	.541
		Other	37	39.24	9.278		

Duration	First 2 years	181	38.77	9.41696	.914	.361
	3 years and above	189	37.80	10.777		

* p< .05. ** p< .01

Upon examination of Table 5, according to independent samples t-test results, gifted and talented students' average scores on interest in physics reveal a significant difference in terms of gender (p< .05) and identification type (p< .01). According to this, it can be said that male students ($\bar{X}$=34.92) show more interest in physics courses than female students ($\bar{X}$=37.04). It can be said that only those identified with the area of intellectual ability ($\bar{X}$=36.34) have higher interest scores than those identified with other areas ($\bar{X}$=32.05) in terms of interest shown for physics. Compared to those identified with other areas ($\bar{X}$=36.43), those identified with the area of intellectual ability ($\bar{X}$=40.97) show higher interest in chemistry (p< .01); those identified with the area of intellectual ability ($\bar{X}$=38.07), in comparision to those who are identified with other areas ($\bar{X}$=34.67), show more interest in biology (p< .05). In addition, those who attend SAC for two years ($\bar{X}$=38.72), compared to those who have attended BİLSEM for three or more years ($\bar{X}$=36.78), show more interest in biology (p< .05). A significant difference was found in terms of gifted students' interest score averages in literature and philosophy courses in relation to gender variable (p< .05). It can be said that female students ($\bar{X}$=35.00), in comparision to male students ($\bar{X}$=27.77), have more interest in literature. Also female students ($\bar{X}$=33.81), in comparision to male students ($\bar{X}$=30.15), have more interest in philosophy course. Interest in informatics course significantly differs in terms of variables gender, identification area, and years of attending to SAC (p< .01). According to this, male students ($\bar{X}$=43.25) compared to female students ($\bar{X}$=36.45); those identified with intellectual ability area ($\bar{X}$=40.19) compared to those diagnosed in other areas ($\bar{X}$=34.62) and those who have attended SAC for two years ($\bar{X}$=41.32) compared to those who attended SAC for three or more years ($\bar{X}$=38.01) reveal a higher score of interest in informatics. In addition to the independent samples t-test, another difference test, ANOVA test, was used in the analysis of the data. For ANOVA test ITRP-1 and ITRP-2 groups; SP-1 and SP-2 groups; STRP-1, STRP-2, STRP-Painting and STRP-Music groups were combined in their respective areas. Members in the project development group were excluded due to their small group size. ANOVA results are shown in Table 6.

Table 6. ANOVA results of the scale scores depending on which group students are identified with

Courses	Groups	Sum of Squares	df	Mean Square	F	p	Significant Difference
Mathematics	Between Groups	448.763	2	224.381	2.314	.100	
	Within Groups	34612.834	357	96.955			
	Total	35061.597	359				
Physics	Between Groups	1367.504	2	683.752	8.271	.000**	ITRP>STRP, SP>STRP
	Within Groups	29512.896	357	82.669			
	Total	30880.400	359				
Chemistry	Between Groups	844.378	2	422.189	7.425	.001**	ITRP>STRP, SP>STRP
	Within Groups	20300.486	357	56.864			
	Total	21144.864	359				
Biology	Between Groups	992.452	2	496.226	6.601	.002**	SP>ITRP ITRP>STRP, SP> STRP
	Within Groups	26836.704	357	75.173			
	Total	27829.156	359				
Literature	Between Groups	318.429	2	159.214	1.969	.141	
	Within Groups	28873.346	357	80.878			
	Total	29191.775	359				
History	Between Groups	528.062	2	264.031	3.064	.048*	SP > ITRP, SP>STRP
	Within Groups	30759.602	357	86.161			
	Total	31287.664	359				
Geograph	Between Groups	756.350	2	378.175	5.823	.003**	SP > ITRP, ITRP >STRP, SP> STRP
	Within Groups	23183.425	357	64.940			
	Total	23939.775	359				
Philosophy	Between Groups	241.419	2	120.710	1.668	.190	
	Within Groups	25833.556	357	72.363			

	Total	26074.975	359				
Infomatics	Between Groups	3106.480	2	1553.240	16.155	.000**	SP> ITRP, ITRP>STRP, SP>STRP
	Within Groups	34324.620	357	96.147			
	Total	37431.100	359				
English	Between Groups	269.703	2	134.852	1.324	.267	
	Within Groups	36368.697	357	101.873			
	Total	36638.400	359				

* p< .05 ** p< .01 **SP:** Supportive Program **ITRP:** Individual Talent Recognition Program **STRP:** Special Talent Discovery Program

Upon examination of Table 6, significant statistical differences were found in scores of gifted students from different groups in SAC for physics [$F_{(2,357)}$= 8.271, p< .01]; chemistry [$F_{(2,357)}$= 7.425, p< .01]; biology [$F_{(2,357)}$= 6.601, p< .01]; history [$F_{(2,357)}$= 3.064, p< .05]; geography [$F_{(2,357)}$= 5.823, p< .01]; and informatics [$F_{(2,357)}$= 16.155, p< .01]. According to the results of LSD test, which was conducted to find out which groups differ between the average scores of interest in different courses according to the groups, ITRP group ($\bar{X}$=36.13) compared to STRP group ($\bar{X}$=32.18), and SP group ($\bar{X}$=37.88) again compared to STRP group ($\bar{X}$=32.18) reveal a higher interest score in physics course. Also ITRP group ($\bar{X}$=40.74) compared to STRP group ($\bar{X}$ =37.75), and SP group ($\bar{X}$=37.88) again compared to STRP group ($\bar{X}$=37.75) reveal a higher interest score in chemistry course. SP groups ($\bar{X}$=32.48) compared to ITRP group ($\bar{X}$=30.18), and STRP group ($\bar{X}$=29.23) reveal a higher interest score in history course. SP group ($\bar{X}$=39.81) compared to both ITRP ($\bar{X}$ =37.50) and STRP ($\bar{X}$ =34.94) groups, and ITRP group ($\bar{X}$ =37.50) compared to STRP ($\bar{X}$ =34.94) group reveal a higher interest score in biology course. SP group ($\bar{X}$ =37.63) compared to both ITRP ($\bar{X}$ =35.67) and STRP ($\bar{X}$ =33.37) groups, and ITRP ($\bar{X}$ =35.67) group compared to STRP ($\bar{X}$ =33.37) group reveal a higher interest score in geography course. SP group ($\bar{X}$ =43.19) compared to both ITRP ($\bar{X}$ =39.79) and STRP ($\bar{X}$ =34.52) groups, and ITRP ($\bar{X}$=34.52) group compared to STRP group reveal a higher interest score in informatics course.

Discussion

The aim of this study is to determine the course interests of gifted and talented students. For this purpose, the interest rate averages of gifted students were determined according to the courses. In the process of education, one variable associated with learning is students' interest. According to Hidi (1990) interest plays an important role in learning process and classes. Interest is a motivational variable that combines the emotional and informational aspects of motivation; and attention, concentration and impact characterizes this psychological condition (Hidi, 2006). Educators and teachers express that interest is a motivational prerequisite for learning and teaching (Ainley et al., 2002). Considering the classroom environment for such a situation, at least a little interest sparked in the student towards the course is a prerequisite for the student to be engaged with the course and allow the student to try to learn that course out of curiosity (Güven-Yıldırım & Köklükaya, 2016). Especially in school environments, interests that establish the classroom behavior may occur as a result of social categories such as culture and gender (Ainley et al., 2002). However, students can also carry their preexisting interests into the school environment (Bergin, 1999). In this context, it is necessary to investigate preexisting interests in students and support these interests in a way that will increase them further. If the student has an interest in the course and the subject, this activates a strong desire to learn and makes learning easier. At the same time students learn faster, store subjects they learn in memory for longer periods of time and are more successful in courses they are interested in (Güven-Yıldırım & Köklükaya, 2016).

Determining the interests of gifted students is considered important for creating and providing them with individual support (Němcová, 2016). Determining the student's interests helps us develop these areas or make the necessary interventions by identifying factors affecting the ineartia (Clark, 2013; Němcová, 2016). Giftedness is not a constant state, it is influenced by extensive individual and social factors (Clark, 2013). Most publications about giftedness today have lists of typical characteristics of gifted children (Clark, 2013; Davis et al., 2011; Sak, 2014). Typical characteristics stand out in determining giftedness, but it is not enough (Pfeiffer, 2015). Typical characteristics showing signs of giftedness in children should be considered together with their interests and abilities (Němcová, 2016). It is crucial to determine the topics and courses they are interested in, and their potential abilities which they bring together with their characteristics (Brigham & Bakken, 2014; Preiffer, 2015). These interests can be used to identify giftedness in people, as

well as play a vital role in supporting them (Clark, 2013; Pfeiffer, 2015). The common goal of many educational systems is to provide a qualified and quality service in line with the interests and abilities of students (Kaplan & Hertzog, 2016). Abilities and skills are the foundation of the phrase “talent” in expressions such as "very talented compared to their peers" or "have the potential to become very talented", (Němcová, 2016). Because of this, determining interests is an important step in the discovery of abilities.

As a result of this study, it was observed that students show interest the most in chemistry, informatics and mathematics; and the least in history, literature and philosophy. Çöllüoğlu Gülen (2017) has discovered that gifted students show more interest in scientific courses. In a study conducted on students enrolled in SAC, students have stated that chemistry course "helps in associating information in general and achieving reasoning" (Başar Daz et al., 2010). The second most interested course observed was Informatics. With today's technological developments, the ability to think computationally has emerged as one of the skills that people should acquire (Wing, 2006). This skill includes subskills such as creative thinking, critical thinking, algorithmic thinking and problem solving (Wing, 2006; Schreglmann & Öztürk, 2018). Gifted and talented children stand out with their competence in using high-level cognitive skills (Schreglmann & Öztürk, 2018). One of the common points for both chemistry course and the ability to think computationally is mathematical logical intelligence. Computational thinking is not the same as mathematical logical thinking, but they are connected (Barr et.al., 2011). Similarly, there is a relationship between success in chemistry and mathematical logical intelligence. In addition to that, a study conducted on the gifted revealed that mathematics is described by them as "discoverable, linear, complex, composed of parts, has depth and infinite" (Öztürk et al., 2014). Mathematical logical intelligence, rather than memorizing concepts, allows the use of cognitive skills such as understanding, assimilation, adaptation and analysis (Öztürk et al., 2014).

Another finding of the study is related to gender differences. It can be said that male students have a higher interest in courses of physics and informatics than female students. Female students are more interested in literature and philosophy courses. This result is consistent with other study results. Literature of this field shows that boys are better at courses that involve science and math, and girls are better at social classes such as literature (Olszewski-Kubilius & Lee, 2011; OECD, 2019). In addition, this difference appears to be more common in gifted students than in average students (Preckel et.al. 2008). It has been found that this difference is influenced by the expectation of success due to gender stereotypes by people in the environment (Bleeker & Jacobs, 2004). The similar resulting stereotypes can be seen in different societies. A study conducted in Germany has shown that male students are more interested in physics than female students. It was found that while the physics course was the least interesting course for female students, it was the most interesting course for male students. In addition, the study has shown that male students are less interested in literature and foreign languages than female students (Hoffmann, 2002).

It is observed that those who have attended SAC for at least two years show greater interest in courses of biology and informatics compared to those who have three or more years in SAC Centers. Although gifted and talented people have a heterogeneous structure within themselves, when we think about the community formed by this group within the framework of normal distribution curve, we can expect that their interests and abilities will differ among themselves. The role of family, environment and society in the formation of interest from an early age cannot be ignored (Clark, 2013; Mazer, 2012). At a young age, social priorities with a limited environment can arouse interest in certain areas. But then the opportunities and environments that can be offered for different areas, subjects and courses can lead to a change of interest (Mazer, 2012). By presenting physical environments for different areas, the potential of the gifted can be revealed and their interests can be supported. The various facilities and environments offered in SAC Centers can lead to recognition of more areas for gifted students (Bakan, 2019). It is also believed that the findings obtained as part of the study may also be due to this condition.

According to the identification groups in the entrance to SAC, it can be said that those identified only with intellectual ability have a higher interest in physics, chemistry, biology, and informatics than those identified with other types of fields. This may be due to the fact that areas other than the general area of intellectual ability in SAC’s identifications are more art-oriented, other areas being painting and music. More art-oriented content and environments

are offered to gifted students who are recognized for their visual artistic and musical talents (MNE, 2019a, 2019b). As a result, gifted students identified with the intellectual ability may have more interest in courses and fields that can be called basic sciences, while gifted students identified with the fields of visual arts and musical ability may have more interest in artistic fields.

Study findings indicate that ITRP groups, compared to STRP groups, have more interest in physics, chemistry, biology, geography and informatics. SP group compared to STRP group have more interest in physics, chemistry, history, biology, geography and informatics. SP groups, compared to ITRP groups have more interest in history, biology, geography and informatics. ITRP, STRP and SP group each have unique content and features. While SP groups are groups in which students identified with intellectual ability take all courses, ITRP groups aim to make these students identified with intellectual ability notice their special abilities. Therefore, they are groups where the interest of gifted students is concentrated in several areas and courses. For this reason, students in ITRP group have interests directed towards less courses and fields that they themselves determined (Bakan, 2019). STRP groups aim to improve special abilties of those from different fields who completed the orientation program and those from the field of general intellectual abilities who completed ITRP program (MNE, 2019b). Thus, STRP groups' gifted and talented students get very specific interest courses and topics and are encouraged to continue their studies in these topics (Bakan, 2019). In this context, it is believed that the result of the study shows that SAC has achieved the goal of revealing the importance of interest.

Implications

In this study, the course interests of gifted and talented students were examined in a cross-sectional design. It is believed that longitudinal studies may be more useful in future studies. In addition, certain groups of students are larger due to years SAC became widespread. A repeated study in later years are predicted to overcome this limitation. From a pratical point of view, determining the interests of students is important in terms of increasing the activities for the target courses. This is why when transferring to ITRP groups, it is believed that this scale can be adapted.

Declarations

Conflict of interest the authors declare that they have no confict of interest.

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