Research Article

Impact of language learning strategies on technology addiction and coping skills in gifted adolescents

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Article Info	Abstract
	Aim of this study is to examine the effect of language learning strategies on technology addiction and coping skills in gifted adolescents. In this regard, relational screening model was implemented in this study. The study group of the research consisted of 246 adolescents between the ages of 10-18 who were studying in Science and Art Centers and who volunteered to be included in the present research. The relevant data were obtained by applying 'Demographic Information Form', 'Technology Addiction Survey', 'Language Learning Strategies Inventory', and 'Coping Scale for Adolescents'. Independent sample t-test was used to compare the averages of two groups in demographic variables; One-way ANOVA test result was used to compare more than two independent groups. Both univariate and multivariate regression analyses were used to evaluate the predictability of the dependent variable by the independent variable(s). Pearson correlation coefficient was calculated in the relationship analysis of the scales. The analysis of the data revealed that the level of technology addiction of adolescents was significantly high. Negative coping and avoidant coping levels of adolescents were significantly high. Active coping levels were found to be significantly low. According to the results obtained when technology addiction and coping skills of gifted adolescents were investigated, we determined a negative and significant relationship between technology addiction and active coping. There was a positive and significant relationship between technology addiction and negative coping. Some demographic variables significantly affected the development of technology addiction and coping strategies. In the current study, the importance of guiding gifted adolescents and developing awareness about language learning strategies for the development of active coping strategies was emphasized respectively. It is anticipated that the data obtained in the study will create an important information infrastructure in interventions related to technology addiction and coping skills in gifted adolescents.

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Introduction

Gifted adolescents have extraordinary intelligence, creativity, and problem-solving abilities. These characteristics enable them to generate innovative ideas in a wide range of fields from art to science, from mathematics to engineering (Mudrak & Zabrodska, 2015). Supporting and encouraging such talents is of great importance for the progress of society. Gifted adolescents may have a high potential for academic success. Raising gifted adolescents in a healthy educational environment can form the cornerstones of scientific and technological progress. These individuals can make significant contributions to the scientific knowledge of society with their future academic and professional achievements

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(Jonathan, 1988). Gifted adolescents can pioneer important changes and innovations in various fields of societies. Their capacity to come up with solutions to social problems, develop innovative business ideas, and lead social projects is critical for supporting social development (Clark, 2015). In addition, these young people can be a source of inspiration for their environment. Their achievements and talents can provide motivation for other individuals to discover their potential and achieve their goals. Their success stories can set a strong example in the fields of education and personal development (Worrell et al., 2018). Providing opportunities for gifted adolescents to realize themselves may enhance both their individual development and social welfare. The support provided in education and personal development helps these young people to express themselves in the best way and maximize their social potential (Robinson, 2008). Particularly supporting them in the use of rapidly developing technological tools can enable them to access data rapidly (Tortop, 2022).

Gifted adolescents often have a natural interest in digital technologies owing to their high cognitive capacities and deep passion for learning (David, 2023). Technological devices and digital tools allow gifted adolescents to satisfy their intellectual curiosity, access information quickly, and work on various creative projects (Gül & Ayık, 2023). Internet, software applications, and various technological tools foster gifted adolescents' ability to solve problems and develop new ideas. This interest contributes to their success in the rapidly changing digital world and producing innovative solutions in the field of technology (Çubukcu & Tosuntaş, 2018). The special interest of gifted adolescents in technological devices and digital tools provides an opportunity for them to discover their own talents through technology and the Internet. Online education platforms may offer the opportunity to develop their talents in areas such as coding tools, digital art, and game development. These tools can further promote their creative and analytical thinking skills and contribute to their success in their careers (Ogurlu et al., 2021).

The special interest of gifted adolescents in technological devices and digital tools involves both great opportunities as well as some risks. It is important for these young people to use technology in an efficient and balanced way so that they can realize their potential in the best way, however, this increased interest may also pose some challenges (Kurnaz & Tepe, 2019). In particular, over-reliance on technology can lead to distancing from social interactions or time management problems. This may have negative effects on the academic achievement, and general mental health of gifted and talented adolescents (Siegle, 2015). The high cognitive capacities of these young people and their intense interest in technology may also lead to reduced social interactions and difficulties in face-to-face interactions. The development of social skills is often based on real-life experiences, and limited interactions in the digital environment can cause deficiencies in social skills (Karabulut-Coşkun & Akar, 2022). In addition, technology addiction can have negative effects on academic performance. Prolonged screen time can potentially result in distraction and time management problems, which can negatively interfere with academic achievement and the learning process. Technology addiction in gifted adolescents may also trigger physical health problems. Extended periods of sitting and screen time can bring about eye health problems, posture disorders and general physical health disorders (Tsai & Lin, 2003). Nevertheless, there may also be risks in terms of mental health. Excessive engagement with technological devices in technologically gifted adolescents can trigger psychological problems such as anxiety, depression, and low self-esteem. Such emotional difficulties can negatively influence the overall quality of life and happiness of adolescents. Moreover, this addiction may increase the tendency to develop addictions and pave the way for the formation of other harmful habits (Zimlich, 2016). Similarly, technology addiction may restrict adolescents' creative and problem-solving skills. Excessive use of technology can hinder these young people's ability to solve real-world problems and their creativity because such skills often require a variety of physical and social interactions (Peterson et al., 2009). For these reasons, understanding and managing the risks of technology addiction in gifted adolescents is critical to support healthy development in both individual and societal domains. It is essential to develop gifted adolescents' skills to cope with technology addiction and other behavioral problems (Ersoy & Deniz, 2016).

Coping skills in gifted adolescents are defined as behavior, thought, or feeling patterns to protect the internal integrity at the highest level, to calm oneself, and to sustain daily life at an optimal rate in stressful situations encountered in life (Parker & Endler, 1992). Since coping is all of the cognitive and behavioral efforts of adolescents to overcome the

demands from themselves or their environment in the face of a stressful situation or circumstances, there is a significant relationship between technology addiction and the development of coping skills (Anda et al., 2000). Coping is associated with the ability to eliminate the harmful effects of stress and to use stress as a tool for development (Vucenovic et al., 2023). Davis and Humphrey (2012) suggest that the personal resources of adolescents can be evaluated in eight categories by considering their resilience, coping, and adaptation. These categories are innate intelligence, knowledge and skills, personality traits, physical, mental, and emotional resilience, sense of dominance, the belief that there is constant control in life conditions, self-esteem level, sense of consistency, ethnic identity and cultural background. In addition, there are studies indicating that the inability to use time appropriately, postponing work, leaving tasks to the last moment, and being under time pressure are important sources of stress (Baker, 1995; Eren et al., 2018; Pfeiffer, 2002). Therefore, one can argue that coping skills are related to the emotions, cognitions, and behaviors of gifted adolescents in stressful situations and conditions.

Gifted adolescents also use coping skills when employing language learning strategies. Language learning strategies should be determined based on their high cognitive capacities and learning skills. Gifted adolescents frequently need personalized learning plans that are appropriate to their learning pace and style. This makes the language learning process more motivating and effective. These young people may be interested in developing language learning strategies with advanced resources beyond standardized materials. In particular, using language-related resources such as advanced language books, academic articles, literary works, and specialized language learning software can help them develop their language skills in more depth (Chamot, 2005). To make language learning more effective for gifted adolescents, it is crucial to use a language in its natural context. Reading books, watching movies, listening to music, and practicing speaking in a foreign language can be effective in the development of language learning strategies of gifted adolescents (Tam, 2013). Utilizing problem-solving and analyzing skills in the language learning process can be useful for gifted adolescents. Analyzing grammatical structures, identifying linguistic structures, and investigating how these structures are used in various contexts can deepen the language learning process of gifted adolescents (Peterson et al., 2009). Gifted individuals tend to learn better through interaction and practice/exploration (Jonathan, 1988). Thus, it is important for them to engage in social and cultural interactions that can enrich the language learning process.

In the process of language learning, gifted adolescents can effectively use technology. Digital tools such as language learning applications, online courses, language learning games, and virtual classrooms can help them improve their language skills (Weinstein & Mayer, 1986). Interactive methods such as creative writing, speaking projects, drama plays, and language games can make the learning process more fun and effective (Tam, 2013). Assessing their own progress regularly and receiving feedback is an important part of the language learning process. Identifying strengths and weaknesses through self-assessment can help improve learning strategies (Chamot, 2005). These strategies to support the language learning process of gifted adolescents will enable them to make the best use of their high potential and develop their language skills effectively, and considering the use of technological devices and coping skills in this process is also critical for a successful language learning experience. Based on this information, it is necessary to examine the role of language learning strategies, technology addiction, and coping skills in gifted adolescents.

Method

Research Design

In this study, the relational screening model was applied to detect the mediating role of language learning strategies, technology addiction, and coping skills in gifted adolescents. Relationships between concepts are investigated through relational analysis implemented in quantitative research. The relationships between the concepts determined in line with the fundamental purpose are the situation that helps the researcher answer the research questions (Akarsu & Akarsu, 2019, p. 59). In quantitative research, relational screening models specify the presence and/or level of change between two or more variables (Şavran, 2010).

Study Group

The participants of the present research consisted of adolescents between the ages of 10-18 who were studying in Science and Art Centers (SACs) in Konya province and who volunteered to participate in the study. The criteria for inclusion in the study were determined as (1) being between the ages of 10-18 (2) being a student at SAC (3) volunteering to participate in the study. The total sample of this study consisted of 246 participants aged between 10 and 18 years. The socio-demographic variables of the participants are presented in Table 1.

Table 1. Socio-demographic variables of the participants (N=246)

Variables		n	%
Gender	Female	122	49.6
	Male	124	50.4
Age	10-12	91	37.0
	13-18	155	63.0
Number of Children	Single Child	35	14.2
	2 Children	125	50.8
	3 Children	73	29.7
	4 Children	13	5.3
Birth Order	First Child	147	59.8
	Middle Child	38	15.4
	Youngest Child	61	24.8
Age of Mother	40 and below	130	52.8
	41 and above	116	47.2
Age of Father	40 and below	66	26.8
	41 and above	180	73.2
Education of Mother	High School and below	63	25.6
	University and above	183	74.4
Education of Father	High School and below	49	19.9
	University and above	197	80.1

The sample of this study consisted of 246 participants, 122 (49.6%) girls and 124 (50.4%) boys. Of the participants, 91 (37.0%) were children and 155 (63.0%) were adolescents. A total of 35 (14.2%) of the participants were only children. 125 (50.8%) came from families with 2 children, 73 (29.7%) with 3 children and 13 (5.3%) with 4 or more children. Among the participants, 147 (59.8%) were the first child, 38 (15.4%) were the middle child and 61 (24.8%) were the youngest child. Of the participants' mothers, 130 (52.8%) were 40 years of age or younger and 116 (47.2%) were 41 years of age or older. Among the fathers of the participants, 66 (26.8%) were 40 years old or younger and 180 (73.2%) were 41 years old or older. Among the mothers of the participants, 63 (25.6%) had a high school education or below, 183 (74.4%) had university degree or above. Of the participants' fathers, 49 (19.9%) had a high school education or lower, while 197 (80.1%) had a university education or university and higher degrees.

Data Collection Tools

In this current study, which was conducted to examine technology addiction and coping skills in gifted adolescents, data were obtained by applying 'Demographic Information Form', 'Technology Addiction Survey' and 'Coping Questionnaire for Adolescents'.

Demographic Information Form

Information about the age, gender, number of siblings, birth order, age of the parents, and educational status of the parents of the children and adolescents in the study group was obtained with this form.

Technology Addiction Scale

The scale was analyzed for validity and reliability in Turkish by Aydın (2017) and consists of 24 items and 4 sub-dimensions. The scale has 4 sub-dimensions as 'using social networking (6 items), instant messaging (6 items), playing online games (6 items) and using websites (6 items)'. The highest score to be obtained for the whole scale was determined as 120 (24×5) and the lowest score was set as 24 (24×1). While interpreting the arithmetic averages of the whole scale; 0-

24 range of points was determined as 'not dependent', 25-48 range of points as 'low level dependent', 49-72 range of points as 'moderately dependent', 73-96 range of points as 'highly dependent' and 97-120 range of points as 'fully dependent'.

Coping Scale for Adolescents

The validity and reliability of the Turkish version of the scale were conducted by Bedel, Işık, and Hamarta (2014). The relevant study was conducted on a total of 453 students from 7th, 8th, 9th, 10th and 11th grades. To test the construct validity, the previously proposed one-factor, two-factor, three-factor, and four-factor structures were tested via Confirmatory Factor Analysis, and it was observed that the Turkish form of the scale consisting of 15 items was best compatible with the three-factor structure. Criterion-related validity was confirmed by moderate correlations between the sub-dimensions of the scale and trait anxiety. The scale has three sub-dimensions: active coping (items 3, 6, 8, 10), negative coping (items 4, 5, 7) and avoidant coping (items 1, 2, 9, 11). In the scale, a 4-point Likert-type assessment is applied as 'Never', 'Occasionally', 'Most of the time' and 'Always' and it is scored with 0, 1, 2, 3 points. The average score range that can be obtained from the scale is 0-3 points. A minimum of 3 and a maximum of 33 points can be obtained from the scale.

Strategy Inventory for Language Learning (SILL)

This data collection tool was applied in order to examine the meaning-making situations of the participants in the study group from vocabulary level to pragmatic language use. Within the scope of the research, firstly, the necessary permissions were obtained from Rebeca Oxford, the developer of the language learning strategies measurement tool, and the researchers who adapted the 'language learning' scale into Turkish. The measurement tool consists of two different Likert-type scales measuring the frequency of strategy use of adolescents in five dimensions. Both questionnaires administered under the name of language learning strategies consist of six different categories. In the Language Learning Strategies Inventory, there are 9 items in A-Memory strategies, 14 items in B-Cognitive strategies, 6 items in C-Compensation strategies, 9 items in D-Higher cognitive strategies, 6 items in E-Affective strategies, and 6 items in F-Social strategies.

Data Evaluation

SPSS v26.0, one of the statistical analysis programs, was used to analyze the data. Descriptive statistics, including frequency, percentage, arithmetic mean, standard deviation, maximum, and minimum values, and normality distribution assessment, were performed to analyze socio-demographic variables and scale scores. Since the kurtosis and skewness values were between the reference values (± 2), parametric statistical tests were used. Independent sample t-test was used to compare the means of two groups in demographic variables; One-way ANOVA test results were utilized to compare more than two independent groups. For ANOVA test, Levene test was used for homogeneity of variance and for group differences, Tukey HSD and LSD were used if homogeneity of variance was provided ($p \geq 0.05$), and Tamhane multiple comparison test was employed if homogeneity of variance was not provided ($p < 0.05$). In the assessment of the prediction of the dependent variable by the independent variable(s), both univariate and multivariate regression analyses were used respectively. The Pearson correlation coefficient was computed in the investigation of the link between the scales. Thus, all statistical analysis test results were considered at 0.05 significance level.

Findings

In this study, the data obtained from the Technology Addiction Scale, Strategy for Language Learning Inventory, and Coping Scale for Adolescents were presented to investigate language learning strategies, technology addiction, and coping skills in gifted adolescents. Regarding the research variables, the lowest-highest values, mean-standard deviation values, and skewness- kurtosis values were analyzed. The findings are presented in Table 2.

Table 2. Lowest-highest values, average-standard deviation values, and skewness-skewness values of the research variables

Variables		Lowest	Highest	Mean	F	Skewness	Kurtosis
Technology Addiction Scale	Technology Addiction	21	112	50.65	17.73	.71	.15
	Using Social Networking	6	30	13.72	5.19	.61	-.13
	Instant Messaging	6	30	12.16	4.97	.81	.28
	Playing Online Games	6	30	13.00	5.61	.70	-.29
	Using Websites	6	30	11.87	5.59	.81	.83
Coping Scale for Adolescents	Negative Coping	0	9	2.57	1.62	.66	.81
	Active Coping	0	12	6.80	2.48	-.38	.35
	Avoidant Coping	0	12	5.98	2.23	.29	.68
Strategy Inventory for Language Learning	Memory strategies	5	45	32.18	3.71	.57	.11
	Cognitive strategies	7	42	38.62	3.62	.49	.9
	Compensation strategies	7	39	46.31	5.61	.62	.14
	Metacognitive strategies	6	42	33.95	5.59	.54	.8
	Affective strategies	8	37	40.18	3.84	.68	.12
	Social strategies	4	46	43.36	3.36	.39	.9

Table 2 demonstrates that the mean of technology addiction was 50.65±17.73, the mean of social networking was 13.72±5.19, the average of instant messaging was 12.16±4.97, the average of playing online games was 13.00±5.61, and the average of using websites was 11.87±5.59. In addition, the mean of negative coping was calculated as 2.57±1.62, the mean of active coping as 6.80±2.48, and the mean of avoidant coping as 5.98±2.23. In the language learning strategies of the study group, memory strategies were found to be 32.18±3.71; cognitive strategies 38.62±3.62; compensation strategies 46.31±5.61; metacognitive strategies 33.95±5.59; affective strategies 40.18±3.84 and social strategies 43.36±3.36. Skewness and kurtosis values of the research variables were between -1.00 and +1.00. These results show that the data have met the normality assumption. A series of independent sample t-tests were conducted to compare the participants' technology addiction, language learning strategies, and coping levels according to gender. The findings are indicated in Table 3.

Table 3. Comparison of technology addiction, language learning strategies, and coping levels by gender

	Variables	Gender	Mean	F	LB	UB	*t*	*p*
Technology Addiction Scale	Technology Addiction	Female	48.71	17.64	42.96	61.26	-1.699	.091
		Male						
Coping Scale for Adolescents	Negative Coping	Female	52.55	17.68	43.05	47.58		
		Male						
	Active Coping	Female	2.60	1.67	46.18	46.31	.280	.780
		Male						
	Avoidant Coping	Female	2.54	1.58	43.41	33.95		
		Male						
Strategy Inventory for Language Learning	Memory Strategies	Female	6.67	2.41	2.40	40.18		
		Male						
	Cognitive strategies	Female	6.94	2.54	1.93	32.18		
		Male						
	Compensatory strategies	Female	6.20	2.36	2.01	38.62		
		Male						
	Metacognitive strategies	Female	5.76	2.09	2.37	46.31	1.547	.123
		Male						
	Affective strategies	Female	6.67	1.58	6.33	46.31		
		Male						
	Social strategies	Female	6.94	2.41	6.09	33.95		
		Male						

LB: Lower Bound **UB**: Upper Bound

The results obtained with Table 3 show that there is no significant difference between the groups in terms of the mean of any variable (p>.05). In order to compare the participants' technology addiction, language learning strategies, and coping levels by age group, a series of independent t-tests were conducted, and the findings are presented in Table 4.

Table 4. Comparison of technology addiction, language learning strategies, and coping levels by age group

	Variables	Age	Mean	F	LB	UB	t	p
Technology Addiction Scale	Technology Addiction	10-12	45.27	14.60	-12.99	50.18	-3.682	.000
		13-18	43.84		-11.93	49.98		
Coping Scale for Adolescents	Negative Coping	12	53.74	18.65	-1.23	24.46		.000
		13-18	50.29		-0.98	27.02		
	Active Coping	12	2.05	1.46	1.08	23.05	-3.920	
		13-18	2.38		1.17	22.18		
	Avoidant Coping	12	2.87.	1.64	1.28	24.23		
		13-18	2.66		2.02	23.05		
Strategy Inventory for Language Learning	Memory Strategies	12	7.41	2.49	12.1	28.41		
		13-18	6.39		14.3	28.58		
	Cognitive strategies	12	6.45	2.41	20.14	23.05		
		13-18	5.38		17.29	20.58		
	Compensatory strategies	12	5.57	1.83	18.03	24.23	2.964	.003
		13-18	4.98		16.77	23.48		
	Metacognitive strategies	12	6.21	2.41	15.17	28.41		
		13-18	5.58		14.98	26.73		
	Affective strategies	12	7.41	2.49	21.02	24.23		
		13-18	6.94		19.58	23.05		
	Social strategies	12	6.45	2.46	18.69	28.41		
		13-18	5.88		17.93	28.58		

LB: Lower Bound **UB**: Upper Bound

The obtained results in Table 4 indicate no significant difference between the groups in terms of the mean of any of the variables (p>.05).

A series of one-way ANOVAs were conducted to compare the participants' technology addiction, language learning strategies, and coping levels according to birth order. The findings are presented in Table 5.

Table 5. A comparison of technology addiction, language learning strategies, and coping levels based on birth order

	Birth Order	Mean	F		LB	UB	t	p
Technology Addiction Scale	First	51.86	17.62	3.05	48.96	54.5	.832	.436
	Middle	49.08	18.33	2.94	43.05	55.10		
	Youngest	48.75	17.65	3.16	44.23	53.28		
Coping Scale for Adolescents	First	2.68	1.70	2.40	2.96	27.16	.861	.424
	Middle	2.42	1.48	1.93	2.91	27.75		
	Youngest	2.39	1.50	2.01	2.78	24.46		
Strategy Inventory for Language Learning	First	6.75	2.54	6.33	7.16	23.05	.100	.905
	Middle	6.92	2.53	6.09	7.75	24.23		
	Youngest	6.87	2.33	6.27	7.46	28.41		

LB: Lower Bound **UB**: Upper Bound

Table 5 indicates that there is no statistically significant difference among the relevant groups regarding the mean of any variables (p > .05).

A series of independent sample t-tests were conducted to compare the participants' technology addiction, language learning strategies, and coping levels according to the participants' mother's age. The findings are presented in Table 6.

Table 6. Comparison of technology addiction, language learning strategies, and coping levels by mother's age

	Variables	Mother's age	Mean	F	LB	UB	t	p
Technology Addiction Scale	Technology Addiction	40 and younger	51.86	17.62	48.96	54.5	.832	.436
		41 and older	48.36		42.90	56.03		
Coping Scale for Adolescents	Negative coping	40 and younger	2.68	1.70	2.96	47.16		
		41 and older	2.94		2.47	46.28		
	Active coping	40 and younger	2.42	1.48	2.91	47.75	.861	.424
		41 and older	2.02		2.37	46.05		
	Avoidant coping	40 and younger	2.39	1.50	2.78	54.46		
		41 and older	2.46		2.17	53.93		
Strategy Inventory for Language Learning	Memory Strategies	40 and younger	39.75	2.54	7.16	43.05		
		41 and older	37.48		6.29	44.18		
	Cognitive strategies	40 and younger	41.92	2.53	7.75	44.23		
		41 and older	40.02		6.88	43.28		
	Compensatory strategies	40 and younger	36.87	2.33	7.46	48.41	.100	.905
		41 and older	34.94		6.84	46.66		
	Metacognitive strategies	40 and younger	49.08	18.33	4.23	53.28		
		41 and older	46.06		4.38	52.63		
	Affective strategies	40 and younger	48.75	16.28	3.05	55.10		
		41 and older	44.98		3.48	54.29		
	Social strategies	40 and younger	41.92	17.15	4.92	51.47		
		41 and older	40.87		4.06	50.96		

LB: Lower Bound **UB**: Upper Bound

As shown in Table 6, the results indicate that there is no statistically significant variation in any of the variable means between the groups (p > .05).

In order to compare the participants' technology addiction, language learning, strategies and coping levels according to the participants' father's age, a series of independent sample t-tests were conducted. The findings are presented in Table 7.

Table 7. A comparison of technology addiction, language learning strategies, and coping levels by father's age

	Variables	Father's age	Mean	F	LB	UB	t	p
Technology Addiction Scale	Technology Addiction	40 and younger	50.16	10.12	48.96	51.53	-1.43	.153
		41 and older	48.36		42.90	52.07		
Coping Scale for Adolescents	Negative coping	40 and younger	2.68	1.20	2.96	46.83		
		41 and older	2.94		2.47	46.28	-1.29	.197
	Active coping	40 and younger	2.42	1.52	2.91	44.58		
		41 and older	2.02		2.37	46.05		
	Avoidant coping	40 and younger	2.39	1.50	2.78	53.66		
		41 and older	2.46		2.17	53.93		
Strategy Inventory for Language Learning	Memory Strategies	40 and younger	39.75	2.06	7.16	42.19	1.801	.073
		41 and older	37.48		6.29	41.84		
	Cognitive strategies	40 and younger	41.92	2.13	7.75	42.23		
		41 and older	40.02		6.88	48.29		
	Compensatory strategies	40 and younger	36.87	2.33	7.46	48.41		
		41 and older	34.94		6.84	46.66		
	Metacognitive strategies	40 and younger	49.08	18.33	4.23	52.28		
		41 and older	46.06		4.38	51.63		
	Affective strategies	40 and younger	46.75	13.28	3.05	55.10		
		41 and older	44.98		3.48	54.29		
	Social strategies	40 and younger	41.92	17.15	4.92	51.47		
		41 and older	40.87		4.06	50.96		

LB: Lower Bound **UB**: Upper Bound

The findings in Table 7 reveal no significant difference between the groups in terms of the mean of any variable (p > .05).

Pearson correlation analysis was conducted to examine the relationship between the scales applied in the study. The data are presented in Table 8

Table 8. The relationship between technology addiction and coping levels

Variables		Technology Addiction	Emotion Regulation	Active Coping	Negative Coping	Avoidant Coping
Technology	r	1				
Addiction	p	-				
Emotion Regulation	r	,290***	1			
	p	,000	-			
Active Coping	r	-,144*	,192**	1		
	p	,024	,002	-		
Negative Coping	r	,475***	,219**	-,235**	1	
	p	,000	,001	,000	-	
Avoidant Coping	r	,375***	,558****	,050	,368***	1
	p	,000	,000	,434	,000	-

LB: Lower Bound **UB**: Upper Bound

According to the results obtained in Table 8, there is a negative and significant relationship between technology addiction and active coping (r = -.144, p < .05). On the contrary, there is a positive and significant relationship between technology addiction and negative coping and avoidant coping (r = -.475, p < .001; r = .375, p < .001, respectively).

Discussion

In this study, the data obtained from the study conducted to examine technology addiction and coping skills in gifted adolescents are discussed in line with the literature in this section.

Discussion of Findings Related to Technology Addiction in Gifted Adolescents

This present study has shown that the level of technology addiction of adolescents is significantly high. The mean level of technology addiction was calculated as 50.65±17.73, the mean level of using social networks as 13.72±5.19, an average level of instant messaging was 12.16±4.97, an average level of playing online games as 13.00±5.61, and an average level of using websites as 11.87±5.59. The technology addiction levels of the participants were compared in terms of gender, number of children in the family, birth order, mother's and father's age, mother's and father's education level, and the results showed that there was no significant difference between the groups in terms of the mean of any variable. The results of technology addiction and coping skills of gifted adolescents a negative and significant relationship between technology addiction and active coping. On the contrary, there was a positive and significant relationship between technology addiction and negative coping and avoidant coping. There is also a positive and significant relationship between technology addiction and emotion regulation.

The purposes of using technological devices, which seem to be an indispensable element of the lives of gifted adolescents, tend to vary for each gifted child. While the Internet offers a wide research area for them with its speed of access to information, it also comes with risks. One can regard that the steps to be taken for the prevention and intervention of these risks are important. A study has shown that lifestyle effects caused by increased access and use of screen-based digital media devices cause poor sleep hygiene in individuals (Ersoy & Deniz, 2016). One may claim that the moderate level of technology addiction of specially gifted adolescents in the study group within the scope of the research has a negative effect on sleep quality; this situation may be associated with the fact that the adolescents participating in the study have various technological tools and use them for a long time.

Despite the studies reporting a significant relationship between technology addiction and age, there are also studies that do not find a significant difference in terms of age. Şahin's (2018) study, which investigated the impact of internet and computer game addiction on the social behaviors of gifted children in school, revealed that boys engaged in internet use and computer gaming for longer durations than girls. In addition, whereas the total score of internet and computer use and the sub-dimension score of internet use differed according to the age variable, the sub-dimension score of

computer game playing time did not make a difference. It was revealed that the total score of internet and computer use and the sub-dimension score of internet use increased with age. Yavuz (2018) analyzed online and gaming addiction alongside perceived social support levels in gifted adolescents, investigating the addiction scores in relation to multiple variables. As a result of the research, internet addiction did not differ according to gender variable, while game addiction scores were higher in males. Internet and game addiction levels differed according to the age variable. The scores of students aged 12-17 years were higher than the scores of adolescents aged 9-11 years. Although game addiction did not differ in terms of weekly internet use, we determined that the internet addiction levels of individuals who used the internet for 21 hours or more per week were higher than those who used the internet for 7-13 hours per week. Both Internet addiction and game addiction were found to differ based on the purpose of Internet use variable. The internet addiction scores of those who use the internet for chat-social sharing, games, listening to music, and watching videos were found to be higher than those who use the internet for homework-research purposes, but no differentiation was found between the other groups. As a result of the study conducted by Taşdemir (2017), in which the relationship between the attitudes of gifted adolescents towards computers and their self-learning with technology was examined, it was revealed that the attitude scores of male students towards computers were higher than the scores of female adolescents. Usta (2016) examined internet addiction in gifted adolescents according to different variables and found that internet addiction of gifted adolescents did not vary with regard to parental education level, socioeconomic level, having internet at home, and having a tablet, whereas it differed with regard to gender, age, parental relationship status, having a smartphone and computer, purpose of internet use and daily internet usage time. Accordingly, we may claim that the internet addiction levels of male adolescents are higher than those of female adolescents, the internet addiction levels of adolescents aged 12-17 are higher than those of adolescents aged 7-11, and the internet addiction levels of adolescents whose parents are separated are higher than those of adolescents whose parents are together. Considering the prevalence and risks together, we are of the opinion that implementing intervention programs for technology addiction could reduce developmental risks and enhance prospects for adolescents.

Discussion of Findings Regarding Language Learning Strategies by Gifted Adolescents

In our study, we revealed that demographic variables such as age, gender, birth order, and parental age did not affect the language learning strategies of gifted adolescents. Language learning strategies are specific skills that help gifted adolescents make the best use of their high cognitive capacities and learning abilities. Gifted adolescents often exhibit different needs in terms of speed and depth in their learning processes. Therefore, there are research results suggesting that creating personalized learning plans will enable individuals to develop their language strategies in the best way (Tam, 2013; Weinstein & Mayer, 1986).

Concerning the use of language learning strategies by gifted adolescents, Hsiao and Oxford (2000) emphasize that they should be adapted to the gifted adolescent's current level of knowledge, interests, and learning style. Such adolescents often need more advanced resources that can go beyond standardized materials. In the process of language learning, they develop new and better language-learning strategies by using rich content such as complex texts, academic articles, and literary works (Chamot, 2005). In addition, gifted adolescents benefit from creative learning methods while learning a new language. These methods make the language learning process more interesting and meaningful. Since role-playing games, creative writing tasks, digital projects, and language-based games make learning fun and effective, gifted adolescents combine language learning strategies with different teaching styles (Alhaisoni, 2012). In addition to learning a language, it is also essential to understand the culture of that language. Gifted adolescents have a higher level of motivation than their peers in exploring new contexts and information and making interpretations by combining them with other data (Çubukcu & Tosuntaş, 2018). It is reported that providing opportunities such as cultural interactions, language exchange programs, and international projects in the language learning process will guide gifted adolescents to use language in real-life situations (Vucenovic, Sipek & Jelic, 2023). Technology offers powerful tools to support the language learning process. Language learning applications, online language exchange platforms, interactive course materials, and language learning software enable gifted adolescents to learn language effectively (Demirekin, 2017). Gifted adolescents are able to use their critical thinking and analytical skills in the language learning process. This

enables them to analyze language structures, grammar rules, and vocabulary in depth. Such an approach strengthens the language skills of gifted adolescents. In the studies related to gifted adolescents who apply language learning strategies, there are generally studies that they individualize the language learning process in accordance with their own interests, choose materials and topics for their own interests, increase their motivation when they develop new techniques from language learning strategies, and make the learning process more enjoyable (Davis & Humphrey, 2012; Gül & Ayık, 2023; Kocaman & Kızılkaya Cumaoğlu, 2014; Mudrak & Zabrodska, 2015; Şahin, 2018; Tsai & Lin, 2003). Considering that these strategies can help gifted adolescents optimize their language learning processes and develop their language skills more effectively, we may assume that it is important to personalize and adapt these strategies since the needs of each gifted adolescent may be somewhat diversified.

Discussion of Findings Related to Coping Skills of Gifted Adolescents

In the present study, we analyzed technology addiction and coping skills in gifted adolescents and found that there was a negative and significant relationship between technology addiction and active coping. However, there was a positive and significant relationship between technology addiction and negative coping and avoidant coping. When the literature is reviewed, it seems that stress and coping issues should be addressed during adolescence for healthy development (Zammuner, 2019). Compared to other life procedures, one may state that Adolescence is a stage that necessitates intricate mechanisms for adaptation to swiftly adjust to and tackle changes and challenges in both the internal and external environments. Therefore, how adolescents cope with such changes and challenges is of great importance. In fact, The data indicates that coping challenges among adolescents have been associated with disorders including depression, anxiety, as well as behavioral issues (Anda et al., 2000; Larson et al., 2002) and that adolescents' coping skills play an important regulatory role on psychopathology. Recent advancements in neuroscience and neurobiology indicate that challenges in regulating and coping may be linked to the incomplete development of prefrontal cortex regions that carry out regulatory functions during adolescence (Vucenovic, Sipek & Jelic, 2023). Bickley (2001) suggests that without strong support from parents and without feeling accepted by others, some adolescents may not be successful at school. Koç (2015) identified that gifted and talented adolescents attending the Science and Art Centre were able to cope with their problems better when they felt that they were understood by their families, their opinions were valued, they were cared for and they received education in line with their abilities. In conclusion, coping skills are a developable trait and academic intelligence, and emotion regulation skills have a strong relationship with each other. Although gifted adolescents potentially display coping skills, they develop as long as the conditions are favorable (Bedel, Işık, & Hamarta, 2014).

Many studies on the coping skills of gifted adolescents show us how high the risk of these adolescents being lonely and unhappy can be available in normal educational settings (Davis & Humphrey, 2012; Jonathan, 1988; Worrell et al., 2018). In an eleven-year longitudinal study (Peterson, Duncan, & Harris, 2009), the negative experiences of gifted adolescents in their school life were also investigated. In this long process, they observed that gifted adolescents experienced social isolation and loneliness among the most challenging experiences. Ersoy and Deniz (2016) aimed to examine the anger coping and decision-making skills of gifted children attending Science and Art Centers in terms of some variables. The survey model was used in the study. In the study, the Anger-Coping and Decision-Making Skills Scale of Gifted Children and Personal Information Form were used. As a result of the analyses, it was found that the dimensions of coping with anger and decision-making skills of gifted children did not differ significantly according to the variables of mother and father education level, number of siblings, income level, whether the parents were alive or not, and marital status of the parents; however, they differed significantly according to the gender variable. These results reveal the necessity of revealing new models about stress and coping in adolescence and increasing studies on the development of coping skills for gifted adolescents.

We compared the technology addiction and coping levels of the participants by gender, number of children in the family, birth order, mother's and father's age, mother's and father's education level, mother's and father's education level, family income status, and the existence of an individual with special needs in the family or a sick/elderly individual cared for by the parent, and the results showed no significant variation between the groups in terms of the average of any of

the variables. The number of families and children/adolescents who meet with technological devices is increasing day by day. In the carried-out research, it has been concluded that the family factor has a very crucial effect on ensuring that technological devices are used as much as necessary and in the right way. In this respect, it is considered a priority to inform both families and adolescents about the proper and effective use of technological devices and to provide them with the skills of conscious use of technological devices at an early age.

Gifted children, who are one of the most important resources of Turkish society, can adopt harmful habits if they cannot find favorable environments for themselves. Although there are numerous studies on technology addiction and coping skills in adolescents, there are not enough research studies examining the relationship between technology addiction and coping skills in gifted adolescents. Analyzing the association between perceived support from others and internet addiction in gifted children was considered to be advantageous for gifted students. Therefore, we may claim that the evaluation of gifted adolescents in terms of technology addiction and emotion regulation skills is very important in terms of early intervention in behavioral problems that are frequently encountered in gifted children and adolescents.

Conclusion

This study, which examined the intermediary role of coping skills in the relationship between technology addiction and emotion regulation skills in gifted adolescents, showed that the level of technology addiction of adolescents was significantly high. In addition, adolescents' negative coping and avoidant coping levels have been significantly high. On the contrary, active coping levels were found to be significantly low. When the intermediary role of coping skills in the relationship between technology addiction and emotion regulation skills in gifted children and adolescents was analyzed, the results showed that there was a negative and significant relationship between technology addiction and active coping. There was a positive and significant relationship between technology addiction and negative coping and avoidant coping. We also found a positive and significant relationship between technology addiction and emotion regulation. In the relationship between technology addiction and emotion regulation skills, coping strategy does not play a mediating role. Nevertheless, the analyses indicated that avoidant coping strategy played a fully mediating role in the relationship between technology addiction and emotion regulation skills. The mediating role of active coping strategies in the relationship between technology addiction and emotion regulation skills was analyzed and we revealed determined that active coping strategies did not play a mediating role.

In line with the results obtained, more specific areas of addiction such as smartphone or game addiction can also be investigated in prospective research on technology addiction. Comparative studies can be conducted between adolescents who attend Science and Art Centre and students who do not attend such settings. Cognitive-behavioral-based group guidance programs can be organized to prevent technology addiction in gifted adolescents and experimental studies can be performed on their effectiveness. Attitudes of parents of gifted adolescents toward their children's use of technology can be examined. The current study determined the technology addiction and coping skills and sub-domains of gifted adolescents. In a different study, the extent to which gifted adolescents can use emotional intelligence skills together with these concepts can be further investigated by adding the concept of emotional intelligence skills.

In the future studies, it is recommended that the number of gifted adolescents should be increased and re-evaluated. In addition, informing families and adolescents about the correct and effective use of technological devices and giving children the skills of conscious use of technological devices at an early age is considered a matter of priority. There seems to be a significant relationship between having a phone with internet access and technological device addiction. Accordingly, since the perceptions of deprivation, control difficulties, functional impairment, and social isolation related to technological device addiction of adolescents who have a phone with internet access were found to be significantly higher, it is necessary to raise awareness of families about the limited use of technological devices. It is critical that the communication between parents and gifted adolescents is robust. Because the more the bond between the parents and their children increases, the better results are obtained by bringing up the anger about the time spent in the virtual environment. Moreover, in cases where their communication with their parents is strong, there will be an increase in their ability to regulate emotions and cope with the relevant problems.

References

Akarsu, B. & Akarsu, B. (2019). Bilimsel araştırma tasarımı. Nicel, nitel ve karma araştırma yaklaşımları. İstanbul: Cinius Yayınları.

Alhaisoni, E. (2012). Language learning strategy use of Saudi EFL students in an intensive English learning context. *Asian Social Science,* 5 (13), 115-127.

Anda, D., Baroni, S., Boskin, L., Buchwald, L., Morgan, J., Ow, J., Siegel Gold, J., Weiss R. (2000). Stress, stressors and coping strategies among high school students. *Child. Youth Serv. Rev.* 22:441–463

Aydın, F. (2017). Teknoloji bağımlılığının sınıf ortamında yarattığı sorunlara ilişkin öğrenci görüşleri. Yüksek Lisans Tezi. Ankara Üniversitesi Eğitim Bilimleri Enstitüsü.

Baker, J. A. (1995). Depression and suicidal ideation among academically gifted adolescents. *Gifted Child Quarterly*, *39*(4), 218-223. https://doi.org/10.1177/001698629503900405

Bedel, A., Işık, E. ve Hamarta, E. (2014). Ergenler İçin Başa Çıkma Ölçeğinin (EBÇÖ) geçerlik ve güvenirlik çalışması. *Eğitim ve Bilim* 39(176), 227-235

Bickley, N. Z. (2002). The social and emotional adjustment of gifted children who experience asynchronous development and unique educational needs. *Dissertation Abstracts International*, 62(11), 11-27

Chamot, A. U. (2005). Language learning strategy instruction. *Current Issues and Research Annual. Review of Applied Linguistic.* 25, USA. 112-130.

Clark, B. (2015). Growing up gifted. Developing the potential of children at school and at home. Fatih Kaya ve Üzeyir Oğurlu (Tran.). Ankara: Nobel Yayınları

Çubukcu, Z. & Tosuntaş, Ş. (2018). Üstün yetenekli/zekâlı öğrencilerin eğitiminde teknolojinin yeri. *Elektronik Eğitim Bilimleri Dergisi.* 7(13), 45-57

David, H. (2023). The failure of gifted education in Israel. *Journal of Gifted Education and Creativity*,10(3), 141-155

Davis, S.K., Humphrey, N. (2012). The influence of emotional intelligence (EI) on coping and mental health in adolescence: Divergent roles for trait and ability *EI. J. Adolesc.* 35, 1369–1379

Demirekin, M. (2017). Yabancı dil olarak Türkçenin anlamlandırılmasında kelime ve dil öğrenme stratejileri kullanımı. Doktora Tezi. Hacettepe Üniversitesi Türkiyat Araştırmaları Enstitüsü Yabancı Dil Olarak Türkçe Öğretimi Doktora Programı. Ankara.

Eren, F., Çete, A.Ö., Avcil, S. & Baykara, B. (2018). Emotional and behavioral characteristics of gifted children and their families. *Archives of Neuropsychiatry*, 55(2), 105-117

Ersoy, E. & Deniz M. (2016). Üstün yetenekli çocukların öfkeyle başa çıkma ve karar verme becerilerinin bazı değişkenler açısından incelenmesi. *Elementary Education Online*, 15(3): 1017-1030

Gül, M. D., ve Ayık, Z. (2023). Enrichment studies in gifted education: a bibliometric analysis with studio. *Participatory Educational Research* 10(3), 266-284. http://www.perjournal.com DOI: http://dx.doi.org/10.17275/per.23.55.10.3

Hsiao, T. Y. & Oxford, R. L. (2002). Comparing theories of language learning strategies: A confirmatory factor analysis. *The Modern Language Journal, 86* (3), 368–383.

Jonathan, R. (1988). The notion of giftedness – or 'how long is a piece of string?' *British Journal of Educational Studies*, 26, 2, pp. 111 - 125

Karabulut-Coşkun, B. & Akar, İ. (2022). Internet addiction in gifted students: a systematic review of the literature. *Technology, Innovation and Special Education Research*. 2(1), 78-92

Kocaman, O. & Kızılkaya Cumaoğlu, G. (2014). Yabancı dilde kelime öğrenme stratejileri ölçeğinin geliştirilmesi. *Eğitim ve Bilim*, 39(176), 293-303.

Koç, İ. (2015). Bilim ve Sanat Merkezi'ne devam eden üstün zekâlı/yetenekli öğrencilerin iletişim becerileriyle ilgili görüşleri. *Üstün Yetenekliler Eğitimi ve Araştırmaları Dergisi*, 3(1), 39-53

Kurnaz, A. & Tepe, A. (2019). Examining internet addiction in gifted and talented students through different variables. *Addicta: The Turkish Journal on Addictions*, 6, 665–689 http://dx.doi.org/10.15805/addicta.2019.6.3.0025T

Larson, R.W., Moneta, G., Richards, M.H., Wilson, S. (2002). Continuity, stability, and change in daily emotional experience across adolescence. *Child Development*. 73:1151-1165

Mudrak, J., Zabrodska, K. (2015). Childhood giftedness, adolescent agency a systemic multiple-case study. *Gifted Child Quarterly*, 59(1), 1-17

Oğurlu, U., Kahraman, S. & Kayaalp, A. (2021). Computer game addiction in gifted students and non-gifted children: A caution for technology-oriented STEM activities. *Journal of Education in Science, Environment and Health (JESEH),* 7(2), 128-138. https://doi.org/10.21891/jeseh.841669

Oxford, R. (1990). Language Learning Strategies: What every teacher should know. New York: Newbury Hous Publishers

Parker, JDA, Endler NS. (1992). Coping with coping assessment: A critical review. *Eur J Pers.* 6(5): 321–44

Peterson, J., Duncan, N., & Canady, K. (2009). A longitudinal study of negative life events, stress, and school experiences of gifted youth. *Gifted Child Quarterly*, 53(1), 34-49

Pfeiffer, S.I. (2002). Identifying gifted and talented students. *Journal of Applied School Psychology*, 19(1), 31- 50. https://doi.org/10.1300/J008v19n01_03

Renzulli, S. J. (1998). The three-ring conception of giftedness. In S. M. Baum, S. M. Reis & L. R. Maxfield (Eds.). Nurturing the gifts and talents of primary grade students (pp. 133-172). Mansfield Center, CT: Creative Learning Press

Robinson, N. M. (2008). Early childhood. In J. A. Plucker & C. M. Callahan (Eds.), Critical issues and practices in gifted education: What the research says (pp. 179-194). Prufrock Press

Siegle, D. (2015). Technology: Learning can be fun and games. Gifted Child Today, 38(3), 192-197.

Şahin, F. (2018). İnternet kullanımı ve bilgisayar oyun bağımlılığının üstün zekalı ve yetenekli çocukların okul sosyal davranışlarına etkisi. Yüksek lisans tezi, Bahçeşehir Üniversitesi, İstanbul

Şavran, T. G. (2010). Bilimsel araştırmalarda amaç, problem ve sınırlılıklar. sosyolojide araştırma yöntem ve teknikleri. Anadolu Üniversitesi Yayınları, Eskişehir.

Tam, K. (2013). A study on language learning strategies of university students of Hong-Kong. *Taiwan Journal of Linguistics,* 11 (2), 1-42.

Taşdemir, L. (2017). Özel yetenekli öğrencilerin bilgisayara yönelik tutumları ve teknoloji ile kendi kendine öğrenmeleri arasındaki ilişkinin incelenmesi. Yüksek lisans tezi, Gazi Üniversitesi, Ankara

Tortop, H.S. (2014). Examining the effectiveness of in-service training program for the education of the academically gifted students in Turkey: A Case Study. *Journal for the Education of Gifted Young Scientist,* 2(2), 67-86

Tortop, H.S. (2022). What should we understand from the concept of gifted young scientists education. *Journal for the Education of Gifted Young Scientists*, 10(2), 0-0.

Tsai, C., & Lin, S. (2003). Internet addiction of adolescents in Taiwan: An interview study. *Cyberpsychology & Behavior*, 6(6), 649–652

Vucenovic, D., Sipek, G., Jelic, K. (2023). The role of emotional skills (competence) and coping strategies in adolescent depression. Eur. *J. Investig. Health Psychol. Educ*. 13, 540–552. https://doi.org/ 10.3390/ejihpe13030041

Weinstein, C. & Mayer, R. (1986). The teaching of learning strategies. in: wittrock, m., ed., handbook of research on teaching, Macmillan, New York, 315-327.

Worrell, F.C., Subotnik, R.F., Olszewski-Kubilius, P. & Dixson, D.D. (2018). Gifted Students. *Annual Review of Psychology*, 70, 551–576. https://doi:10.1146/annurev-psych-010418- 102846

Yavuz, O. (2018). Özel yetenekli öğrencilerde internet ve oyun bağımlılığı ile algılanan sosyal destek düzeylerinin incelenmesi. *Yaşam Becerileri Psikoloji Dergisi*, 2(4), 281-296.

Zammuner, V.L. (2019). Adolescents' coping strategies influence their psychosocial well-being. *Current Journal of Applied Science and Technology*. 36(3): 1-17

Zimlich, S. L. (2016). Motivating gifted students: Technology as a tool for authenticity and autonomy. *International Journal of Learning, Teaching and Educational Research*, 15(13), 1-11.