Research Article

Pamukkale University Journal of Education: SS-SS [2021]

doi: 10.9779/pauefd.743418

Investigation of Digital Addiction Levels, Digital Games Playing Status and Interpersonal Problem Solving Skills of University Students*

Arzu DEVECİ TOPAL[1], Serap ÇOLAK[2]

•***Received:*** *27.05.2020*• ***Accepted:*** *9.11.2020*• ***Published:*** *08.04.2021*

Abstract

Nowadays, developments in technology have undoubtedly facilitated people's lives but also have caused the human being to spend longer time with digital tools. While acknowledging the negative effects of digital gaming, this paper poses the question whether their focus on problem-solving within a fun environment actually improves real-world problem-solving and multi-tasking capabilities by helping individual subjects to perform logical analyses, to develop strategic thinking, and by enhancing communication skills. In this context, the study was conducted as a descriptive survey. A total of 521 students from various faculties of Kocaeli University took part in the study and 83.5% of them indicated that they play digital games regularly. To determine the relationship between interpersonal problem solving and digital addiction we used the "*Interpersonal Problem Solving Scale*" and the ''*Digital Addiction Scale*'' to collect data. Students' perceptions about interpersonal problem-solving skills and digital addictions were at a medium level, notably, there was a positive correlation between interpersonal problem-solving skills and the level of digital addiction. Therefore, use of the internet within a reasonable time can have a positive effect to improve certain skills without being dependent on the digital game. In the future, while this study was based solely on students' perceptions, we suggest for further study that the parameters should be extended to observational and experimental studies and scales based on parent and peer notification or psychological tests can be used.

KeyWords: Digital games, digital addiction, ınterpersonal problem solving skills, university students.

* Part of this study was presented at the 12th International Computer and Instructional Technologies Symposium (ICITS).

1 Dr. Informatics Department, Kocaeli University, Turkey.E-mail: arzudevecit@gmail.com Telephone: 90 262 303 1295 orcid.org/0000-0001-5090-8592

2 Assoc. Dr. Faculty of Sports Science, Department of Sports Management, Kocaeli University, Turkey. E-mail: srpclk@gmail.com Telephone: 90 262 303 3657 orcid.org/0000-0003-3093-0607

Cited: Deveci Topal, A. and Çolak, S. (2021). Investigation of Digital Addiction Levels, Digital Games Playing Status and Interpersonal Problem Solving Skills of University Students. *Pamukkale University Journal of Education*. doi: 10.9779/pauefd.743418

Introduction

Technological developments have undoubtedly made some aspects of modern life easier. At the same time, increased use of technology has had some unanticipated psychological consequences, with some individuals becoming increasingly attached to the devices and applications they use. This is the era of communications technology, and in recent decades people have started to integrate technology into long-established human behaviours, such as socializing and playing games together. Digital games, which are visually and cognitively appealing to people in the virtual environment, have started to increase digital vehicle addiction and game addiction (Hazar,2019).

This study explores the effects of digital addiction and asks if gaming can have any positive effects on players. One area upon which this paper focuses is problem-solving. As Bingham (1998) points out, problem solving; consists of a series of efforts to eliminate the difficulties encountered to reach a certain purpose. Itseems possible that practicing problem-solving, a key component in many digital games will help players to hone their skills in this area so that real-life problems become easier to solve. It has been determined in some studies, classroom-based and educational multiplayer digital games improve students' complex problem-solving skills and motivation levels were positively affected by using digital games within a learning context (Eseryel, Ge, Ifenthaler and Law, 2016; Yang, 2012).

Improving one’s problem-solving skills is crucial in the contemporary era, and its importance has been recognized by various developments in today’s educational activities (Anlıak and Dincer, 2005, Kim and Wong, 2020; Sahin, 2004). In particular, the problem-solving process in and of itself enables us to understand cause and effect and interpret relationships between connected issues, evaluate them and make attempts at solutions, and thus it is a process involving the full engagement of one’s intelligence (Yuksel, 2008). However, It is not always possible to learn effective problem-solving skills in daily life. In this case, professionals need to teach these skills systematically. Many of the comprehensive developmental guidance programs prepared with this idea in mind include problem-solving skills (Korkut, 2002; Myrick, 1993). But nowadays, people use digital devices in an enthusiastic

and intense way, and the increase in the use of digital games requires them to make quick decisions to solve the problems they face during the game. They certainly perform the ability to acquire effective problem-solving skills (make quick decisions, perception, attention, task switching or mental rotation),that they do not have in their daily life (Cardoso-Leite& Bavelier, 2014)

Digital games lead to focus on problem solving and provide multitasking skills and entertaining environment for individuals. Also through the effect to make logical analysis, develop strategies, cope with problems they enhance to increase the communication skills(Bayırtepe and Tüzün, 2007). In addition, digital games and particularly educational gamescan be shown to improve educational performance by improving self-confidence and poor skills, alsoby developing visual-attention skills and spatial visualization ability(Griffiths, 2002; Bozkurt, 2014). A digital games enhance learning that provides relationships between subjects, works and mediated social structures and leads to understand the connection between cause and effect (Gros, 2003). Hence, Collins, Brown and Newman (1989) have mentioned, the ability to produce a consistent, appropriate sequence of "constructive learning" is key to environmental design. Digital games that help develop skills such as cognitive development, attention, cooperation and problem solving on the other hand have also negative effects such as addiction, violence, obscenity (Aydogdu Karaaslan, 2015).

Technological addictions such as internet addiction, phone addiction, social media addiction, and digital gaming addiction are some of the increasing numbers of digital addictions. Digital addiction can be understood asthe excessive use of digital devices combined with a failure to satisfy the desire to use, the neglect of activities due to overuse, behaviour which causes damage to social relations, use as a means of escape from negative emotions and life stress, experiencing problems in reducing and stopping use, feeling agitated and angry when not being able to use, and telling lies about the time spent on digital devices (Savcı and Aysan, 2017). Lemmnes, Valkenburg and Peter (2009) defined digital gaming addiction as an excessive or compulsive attachment to the computer and video games that causes social and/or emotional problems in the individual and which is marked by the inability to control this overuse (Lemmnes, Valkenburg and Peter 2009). The World Health Organization's International Classification of Diseases Association has defined game addiction as akin to drug addiction, referring to its hold over the individual as a "digital narcotic drug" and accepting it as a mental disorder(Aarseth et al. 2017). In the contemporary era, according to Tatli and Nordin, one of the mainreasons affecting interpersonal communication and socialization is the excess of time

people spend on digital devices (Tatlı, 2018; Nordin 2014). Thus, one of the most important challenges of our time is to determine the negative effects of digital game (devices) addiction, understand the obstacles such addiction poses to human socialization, and determine both the causes of the addiction and the level of dependence so that society can begin to take measures to mitigate its destructive effects.

As digital gaming is more popular among young people, countries with a significant youth population face particular issues regarding gaming. A case in point is Turkey, which has a young population, of which 31.2 million are regular game players. In 2017, research conducted by Informatics Association of Turkey determined that 31.2 million digital gamers played a total of 40 million hours. This amount of play time reveals that Turkey is among the top three digital gaming nations worldwide (Informatics Association of Turkey, 2017). Naturally, in a country where the digital games are played so long, the levels of digital addiction of individuals will increase and the problems caused by this will be increased.

In this context, according todata gathered by the Turkish Statistical Institute (TSI), the use of the internetwas seriously increased since 1992 and attained 79 % in 2020 year between 16-74 age (TUİK, 2020). Furthermore, the frequency of internet use was seen as the highest between 15 and 24 age group (93%) that 15.8% of the population in Turkey 's constituting(TUIK, 2018),namely the digital games use was more widespread among university students. Furthermore, according to Young (2004), the biggest risk group for internet addiction was university students. Therefore, the population of university students was variable both according gender and educational department (behaviour difference between educational department) and also was in a suitable age range conform to Turkih Standart Institute data.

Nevertheless, digital games that have positive effects on cognitive development, attention-span, cooperation and problem-solving often have negative elements such as the normalization of violence and obscenity (Aydoğdu Karaaslan, 2015; Yalcın, Irmak and Erdoğan 2016). Moreover, an addictive attachment to playing the games themselves frequently develops. Because digital games are marketed to the public as free-time entertainment and fun activities, their potential to constitute a great risk for children and young people is significant. Where digital gaming is a popular past time we can expect levels.

When looking at the studies on problem-solving skills with reference to university students, many cite the relationships between different dependent variables such as academic achievement, gender, socio-economic level and the departments of university students (Alver, 2005; Greening, 1997). On the other hand Bhagat, Jeong, and Kim (2020), examined that

relation between digital addiction, interpersonal incompetence, need for online social interaction and self-regulation and determined that digital addiction to be is high key role of interpersonal incompetence, need for online social interaction and self-regulation (control) in predicting game addiction. Additionally said that loneliness, interpersonal incompetence, need for online social interaction and low self-regulation influence the extent of digital game addiction.Also Wan ve Chiou (2006) made a study with adolescents with online game addiction via interview method and exemined the four subfactors of depression (surface motivations, source motivations, self-conception, and interpersonal relationships in real life) and they determined that only the interpersonal factor showed a significant effect on game addiction. In another research Ar Rosyid et al.(2019) exemined that online game addiction of the students of electrical engineering, their psychological state, and also their interpersonal relationships and determined that playing online games contributed to the student's psychological state, emotional level, time management, and also problem-solving ability.On the other hand, Şahin, İbili, and Uluyol (2017), determined that there was an opposite relationship between these two variables in a study examining the relationship between pre-service teachers' internet addiction and their problem solving tendencies. In these studies, some relationships were found between digital addiction and gender and demographic characteristics, factors of depression, social interaction, self-control, time management, problem solving skills of students at different education levels.

In this study, in addition to examining the relationship between interpersonal problem-solving skills and the sub-factors of digital addiction of students who study at different faculties and departments of our university and who play digital games, the types of digital games that students play, the purposes of playing games, and their opinions about digital games were also examined.There is no study that directly examines the relationship between digital addiction and interpersonal problem solving skills in the literature. Besides, this study differs from other studies in terms of quantitative and qualitative data collection and being more comprehensive. For this purpose, in this study, the digital games-playing status of the university students, their motivations for playing, the types of games they play, the levels of digital addiction and the ability of individuals to cope with problems in everyday life were investigated and examined in terms of various variables. In addition, the relationship between interpersonal problem solving and digital addiction was investigated.

Method

The research was conducted using a descriptive survey model. The findings present in a descriptive survey model areexplained according to various independent variables such as

gender, department, faculty and duration of digital playing (Karasar, 2012). Additionally calculated correlation coefficients between interpersonal problem-solving skills and digital addiction levels and sub-dimensions of scales. The opinions of the participants about digital games were determined with open-ended questions. This research was carried out with the permission of Kocaeli University Social and Human Sciences Ethics Committee with the decision numbered 5 in the meeting dated 23/02/2018 and numbered 2018/02.

Study Group

521 students (mean age:19.96, sd=1.652) participated in our study from different faculties of Kocaeli university in 2018-2019 academic year studied. The study group was determined using an easily accessible sampling method. The distribution of the study group by demographic variables is given in Table 1.

Table 1. *Distribution of working group by demographic variables, education branch, purpose of use*

Genders	N	%
Female	286	55.2
Male	232	44.8
The digital tools they use	N	%
Telephone	481	92.3
Computer	325	62.4
Tablet and play station	56	10.7
Television	51	9.8
Number of people playing digital games	435	83.5
Number of people who spend money on games in playing digital games group	58	13.1
Educational Departments	N	%
Coaching	59	11.4
Archaeology	32	6.2
Biology	51	9.8

Midwifery	49	9.5
Philosophy	33	6.4
Science teacher	60	11.6
Nursing	53	10.2
Recreation	64	12.4
Social service	44	8.5
Sports management	44	8.5
Turkish teacher	29	5.6

When the data of the Table 1 are examined, we can see that the majority of student digital use focuses around their devices – mobile phones and computers. Of our sample population, a significant majority of the students (83.5%) played digital games, but the number who spent money on digital games was low (13.1%).

Data collection tools

In the research, two questionnaires entitled “Digital Addiction Scale” and “Problem-Solving Scale” were used, both of which contain the demographic information of students, questions concerning their individual reasons for playing games, specific information regarding the games they play and other open-ended questions.

Digital Addiction Scale: The scale, which was developed by Kesici and Tunç (2018), was a 5-point Likert-type scale consisting of 19 items with 5 factors, including overuse, non-restraint, inhibiting the flow of life, emotional state and dependence. The internal consistency coefficient for the whole scale was 0.874. The prevailing factors explain 59.51% of the variance. In this study, the internal consistency coefficient was found to be Cronbach alpha=0.897 and KMO=0.921.

Interpersonal Problem-Solving Scale: This scale is a self-assessment scale used to measure the assessment of the individual oftheir personal and interpersonal problem-solving skills.Sahin, Sahin and Heppner (1993) developed the scale based on sixthLikert-type 35 items are located. Minimum of 32 points and a maximum of 192 points can be obtained from the test. The greater the total score the more inadequate the individual perceives himself / herself to be in terms of problem-solving skills. In this study, the internal consistency coefficient was found to be Cronbach's alpha=0.860 and KMO=0.885.

Open-ended questionnaire: The survey contained four open-ended questions: "What are the benefits of digital games you play?"; "What are the negative aspects of the digital games you play?"; "How do digital games affect your social life?"; "What are the inappropriate behaviours you encounter when playing digital games?"

Data Analysis

SPSS 18.0 package program was used to analyse the data. Arithmetic mean, standard deviation, frequency, t test, Anova (sidak, bonferroni, tukey, lsd and dunnet) and correlation analyses were applied to the data. Significance level was accepted as between 0.001 and 0.05.

Assuming that the degree range is equal in the responses to scale items, the highest value is subtracted from the lowest value and divided by the number of degrees. The value of this range is 4/5=0.8 for the Digital Addiction Scale and 5/6=0.83 for the Interpersonal Problem-Solving Scale and is given in Tables 2 and 3. The Pearson Moments product correlation test was used todetermine the amount and direction of the relationship between two variables and the correlation coefficient was found to be between 0.70-1.00 as absolute value 0.70-0.30, medium; 0.30-0.00 low-level relationship (Büyüköztürk, 2004).

In addition, the effect size was calculated to explain the strength of the relationship between dependent and independent variables in these tests and to show whether the difference between the results of the study groups was significant. The effect size ranges reported by Cohenare interpreted as 0.2: low, 0.5: medium and 0.8: high for the t test in independent groups (Özsoy andÖzsoy, 2013). In the analysis of variance, the effect size shows the total variance in the variable and it is found to be between 0.00 and 1.00. The eta-square values at levels 0.01, 0.06 and 0.14 are considered as the small, medium and high effect sizes, respectively (Özsoy and Özsoy, 2013). Limits on the point of distribution of scales are given in Tables 2 and 3.

Table 2. *Limits on the point of distribution of digital addiction scale*

Options	Limits
Agree completely (5)	4.20-5.00
Agree (4)	3.40-4.19
Undecided (3)	2.60-3.39
Do not agree (2)	1.80-2.59
Totally disagree (1)	1.00-1.79

Table 3. *Limits on the distribution of the interpersonal problem-solving scale*

Options	Limits
I always act like this (1)	1.00-1.83
I mostly act like this (2)	1.84-2.66
I often act like this (3)	2.67-3.49
I act like this occasionally (4)	3.5-4.33
I rarely behave like this (5)	4.34-5.16
I never act like this (6)	5.17-6.00

Findings

Table 4 shows the findings related to university students' aims of using digital tools and reasons for playing digital games.

Table 4. *Students' aims of using digital tools and reasons for playing digital games.*

Aims of using digital tools	N	%
Communication	263	50.5
Entertainment	216	41.5
Research	192	36.9
Social media	143	27.4
Education	81	15.5
Game	68	13.1
Reasons for playing digital games.	F	%
Entertainment-pleasure	312	19.31
To get rid of stress	267	16.52

Spend leisure time	215	13.30
Need to win	120	7.43
Competition	116	7.18
Wonder	80	4.95
Motivated	75	4.64
Self-improvement	68	4.21
Affection the imaginary environment	66	4.08
Habit	64	3.96
Social communication	58	3.59
Discovering	57	3.53
Education	53	3.28
Exploring borders	40	2.48
Other	25	1.55
Total	1616	100

Table 4 shows, students' primary reasons for playing digital games are to have fun / pleasure, to de-stress and to relax in their free time and primary aims of using digital tools are communication and entertainment. The findings related to the types of digital games played by university students are given in Table 5.

Table 5. *Types of games played by students*

Games types	N	%
First-person shooter tactical action	123	23.61
Sport	104	19.96

Crossword	73	14.01
War	56	10.75
Racing simulation	55	10.56
Action-adventure, free world, crime	53	10.17
Board games	53	10.17
Role playing MMORPG	49	9.40
Information	46	8.83
Real time strategy	34	6.53
Skill	21	4.03
Platform	10	1.92

According to the table, it was determined that the students mostly preferred to play first-person shooter-type tactical action games, sports games and puzzle games.

Table 6 presents the distribution of the arithmetic mean and the standard deviation values related to digital addiction levels and students' perception of their interpersonal problem-solving skills. According to these results, the students' digital addictions were at a moderate level, the level of addiction to digital tools was high, and the students' perceptions about their interpersonal problem-solving skills were moderate.

Table 6. *Distribution of the arithmetic mean and standard deviation values related to the digital addiction scale and students'perception of their interpersonal problem-solving skills.*

Scales	**N**	$\overline{X}$	**S.d.**
Interpersonal problem-solving skills	435	2.98	0.60
Digital addiction (Total)	435	2.79	0.72
Overuse	435	2.62	0.90

Non-restraint	435	2.51	0.97
Inhibiting the flow of life	435	2.63	0.98
Emotional State	435	2.75	0.91
Dependence	435	3.63	0.93

The results of the ANOVA (Bonferroni, tukey, lsd) test related to the difference between addiction levels (measured according to the duration of digital play) and the perception of interpersonal problem-solving skills are given in Table 7.

Table 7. *ANOVA results of the difference between addiction levels and interpersonal problem-solving skills according to the duration of digital play.*

Daily playing time		N	$\bar{X}$	Ss	f	p	Difference between groups	Effect size(r)
Interpersonal problem-solving skills	Less than 1 hour (1)	288	95.12	19.98	0.096	0.908	-	0.000
	1-3 hour(2)	107	95.58	17.32				
	More than 3 hours(3)	40	96.48	18.09				
	Total	435	95.36	19.15				
Digital addiction (Total)	Less than 1 hour (1)	288	51.80	13.96	4.127	0.016	3-1	0.019
	1-3 hour(2)	107	54.82	13.57				
	More than 3 hours(3)	40	57.4	11.58				
	Total		53.06	13.76				
Overuse	Less than 1 hour (1)	288	12.73	4.59	4.391	0.012	3-1	0.020
	1-3 hour(2)	107	13.47	4.29				

	More than 3 hours(3)	40	14.85	4.16				
	Total	435	13.10	4.52				
Recurrence	Less than 1 hour (1)	288	7.23	2.79	6.917	0.001	3-1 2-1	0.030
	1-3 hour(2)	107	7.89	3.07				
	More than 3 hours(3)	40	8.9	2.97				
	Total	435	7.544	2.92				
Preventing the flow of life	Less than 1 hour (1)	288	10.33	3.95	0.939	0.39	-	0.004
	1-3 hour(2)	107	10.92	3.85				
	More than 3 hours(3)	40	10.73	3.86				
	Total	435	10.51	3.92				
Mood	Less than 1 hour (1)	288	10.73	3.73	2.639	0.072	-	0.012
	1-3 hour(2)	107	11.50	3.52				
	More than 3 hours(3)	40	11.73	3.23				
	Total	435	11.01	3.65				
Not being able to leave	Less than 1 hour (1)	288	10.79	2.72	0.612	0.54	-	0.003
	1-3 hour(2)	107	11.05	2.87				
	More than 3 hours(3)	40	11.2	2.97				
	Total	435	10.89	2.78				

The table shows that while there was no difference in the perception of interpersonal problem-solving skills between those with higher or lower levels of daily playing time [F(2-432)=0,096; p>.05], the level of digital addiction displayed by students playing three hours or more per day was higher [F(2-432)=4,127; p<.05]. When the digital addiction scale is examined in terms of subgroups, it is determined that those who play three hours a day or more are more

addicted and more prone to overuse than others [F (2-432) =4,391; p<.05], and those who play between 3 hours or more and 1-3 hours a day are more dependent on digital gaming than those who play less than an hour [F (2-432) =6,917; p<.01]. Thus it can be concluded that duration has a moderate effect on game addiction. The t test results of the students who play digital games according to sex are given in Table 8.

Table 8. *T test results of the students who play digital games according to gender*

Sex		N	$\bar{X}$	Sd	t	p	Effect size (r)
Interpersonal problem-solving skills	Female	211	96.45	19.17	1.170	.242	0.056
	Male	223	94.30	19.16			
Digital Addiction (Total)	Female	211	54.52	13.24	2.141	.033	0.102
	Male	223	51.70	14.16			
Overuse	Female	211	13.43	4.57	1.428	.154	0.068
	Male	223	12.81	4.47			
Non-restraint	Female	211	7.74	2.93	1.408	.160	0.067
	Male	223	7.35	2.90			
Inhibiting the flow of life	Female	211	10.90	3.87	1.973	.049	0.094
	Male	223	10.16	3.93			
Emotional State	Female	211	11.02	3.69	.067	.946	0.003
	Male	223	11.00	3.63			
Dependence	Female	211	11.43	2.56	3.982	.000	0.19
	Male	223	10.38	2.89			

While there was no significant difference between the interpersonal problem-solving skills of the students who play digital games [t (432) =1.17; p> .05], there was a significant difference between the levels of digital addiction [t (432) =2,141; p<.05]. This study also revealed a gender difference, with female students' levels of digital addiction (X = 54.52) higher than male students' (X=51.7). In terms of sub-dimensions that inhibiting the flow of life [t (432) =1,973; p <.05] and dependence [t (432) =3,982]; It was determined that while female students were more prone to become addicted than male, the gender variable had a relatively low effect on digital addiction.

The results of the ANOVA tests conducted help to determine the difference between the student groups according to the departments where they study and are given in Table 9 and 10.

Table 9. *Distribution of the arithmetic mean and standard deviation values according to the departments of students who play digital games*

		Interpersonal problem-solving skills		Digital addiction	
Departments	N	$\bar{X}$	S.d.	$\bar{X}$	S.d.
Coaching	56	93.95	18.95	50,52	15,02
Archaeology	28	87.68	26.01	53,25	18,27
Biology	31	88.52	23.24	48,03	11,17
Midwifery	38	94.37	17.90	54,84	11,29
Philosophy	26	98.23	21.74	60,08	15,68
Science	43	93.53	15.65	51,63	10,68
Nursing	47	102.62	14.61	55,70	12,48
Recreation	61	102.08	17.38	49,93	16,06
Social service	39	96.51	16.42	54,21	11,93

Sports Management Department	38	94.08	19.58	55,61	12,69
Turkish teacher	28	88.25	17.52	54,11	11,43
Total	435	95.36	19.15	53,06	13,76

According to Table 10, students studying in the archaeology department found themselves better able to handle interpersonal problems than those studying in the nursing and recreation departments, and the biology department was more positive than the recreation department [$F_{(10-424)}$=2,955; p<.01]. When focusing on students' levels of digital addiction, it can be seen that the level of addiction of those students studying in the department of philosophy is higher than those studying coaching education or biology [$F_{(10-424)}$=2,104; p<.05]; overuse subscale in philosophy, studying sports management department of nursing and biology students studying in accordance with section [$F_{(10-424)}$=2,428; p<.01], according to the recreation and biology of the philosophy department in the sub-dimension of non-restraint [$F_{(10-424)}$=2,454; p<.01] and in the sub-dimension of dependence, according to the recreation of the midwifery and Turkish teaching departments [$F_{(10-424)}$=2,604; p<.01] it was determined to be more dependent. Thus, by analysing the department variable, the most notable features are a large effect on interpersonal problem-solving skills and a moderate effect on digital addiction.

Table 10. *ANOVA test results according to the departments of students who play digital games*

Departments		Sum of Squares	df	Mean Square	F	p	Difference	Effect size
Interpersonal problem-solving skills	Between Groups	10372.039	10	1037.204	2.955	.001	Archaeology - Nursing Archaeology - Recreation Biology - Recreation	0.065
	Within Groups	148842.297	424	351.043				
	Total	159214.336	434					
Digital addiction (Total)	Between Groups	3887.617	10	388.762	2.104	.023	Philosophy - Coaching Philosophy - Biology	0.047
	Within Groups	78328.829	424	184.738				
	Total	82216.446	434					
Overuse	Between Groups	479.827	10	47.983	2.428	.008	Philosophy - Biology Nursing - Biology Sports management- Biology	0.054
	Within Groups	8379.309	424	19.763				
	Total	8859.136	434					
Non-restraint	Between Groups	202.283	10	20.228	2.454	.007	Philosophy - Biology Philosophy - Recreation	0.055
	Within Groups	3495.592	424	8.244				
	Total	3697.876	434					
Inhibiting the flow of life	Between Groups	156.249	10	15.625	1.020	.426	-	0.023
	Within Groups	6496.454	424	15.322				
	Total	6652.703	434					
Emotional State	Between Groups	196.536	10	19.654	1.490	.140	-	0.034
	Within Groups	5593.427	424	13.192				
	Total	5789.963	434					
Dependence	Between Groups	193.620	10	19.362	2.604	.004	Midwifery - Recreation Turkish teacher - Recreation	0.058
	Within Groups	3153.083	424	7.437				
	Total	3346.703	434					

The results of the ANOVA tests conducted help to determine the difference between the student groups according to the faculty where they study and are given in Table 11.

Table 11. *ANOVA test results according to faculty*

Faculties		N	$\bar{X}$	S.d.	f	p	Difference	Effect size(r)
Interpersonal problem-solving skills	Education	71	91.45	16.49	3.741	.011	Education. – Health Sciences	0.025
	Art and science	85	91.21	23.94				
	Health Sciences	124	98.17	16.51				
	Sports science	155	97.18	18.81				
	Total	435	95.36	19.15				
Digital addiction (Total)	Education	71	52.61	10.97	1.480	.219	-	0.010
	Art and science	85	53.44	15.79				
	Health Sciences	124	54.97	11.87				
	Sports science	155	51.54	15.01				
	Total	435	53.06	13.76				

According to Table 11, the faculty of education students' perception of their own interpersonal problem-solving skills is more positive than those studying in the faculty of health sciences [f(3-431)=3,741; p<.05]; however, there is no significant difference between the levels of digital addiction [f(3-431)=1,480; p>.05]. It was found that the faculty variable had a moderate effect on the perception of interpersonal problem solving skills and a minor effect on digital addiction.

The relationship between the perception of interpersonal problem-solving skills and digital addiction levels was examined in terms of general dimensions and sub-dimensions and the results are given in Table 12.

Table 12. *Correlation coefficients between interpersonal problem-solving skills and digital addiction levels and sub-dimensions of scales (n=521).*

	1	2	2.1	2.2	2.3	2.4	2.5
1. interpersonal problem-solving skills	-	.300**	.287**	.275**	.274**	.218**	.081
2. Digital addiction (Total)		-	.889**	.804**	.748**	.800**	.639**
2.1.Overuse			-	.683**	.564**	.641**	.500**
2.2. Non-restraint				-	.556**	.562**	.361**
2.3. Inhibiting the flow of life					-	.437**	.287**
2.4. Emotional State						-	.466**
2.5. Dependence							-

**Correlation is significant at the 0.01 level (2-tailed).

According to this table, there was a low level positive relationship between the interpersonal problem-solving skills scale and the digital addiction scale, and a low level relationship with overuse, non-restraint, inhibiting the flow of life, and emotional State. There was a moderately positive relationship between the sub-dimensions of the digital addiction scale.

University students' views on digital games

The findings from our sample student population regarding their personal opinions about digital games are included. In order to indicate particularly widespread or popular opinions, examples are categorized into themes where the highest frequencies were included.

Table 13. *Student views on the positive and negative aspects of digital games*

Positive aspects	f	%	Negatives	f	%
Relieve stress/Eliminate boredom	65	21.5	Waste of time	201	62.8
Have a fun/enjoyable time	56	18.5	Fatigue and pain in the eyes	33	10.3
Spending time	23	7.6	Addiction	30	9.4
Developing strategy and planning skills	22	7.3	Stress creation / irritation	23	7.2
To learn new information and to develop general culture	20	6.6	Headache / numb the brain	11	3.4
Making friends and socializing	15	5.0	Disrupting other jobs / failing to socialize	10	3.1
Improve imagination	15	5.0	Violence	5	1.6
Improve vocabulary	14	4.6	Insomnia	4	1.3
Improve yourself	14	4.6	Mental problems	3	0.9
Winning and competition	12	4.0			
improve foreign language	12	4.0			
Motivation	9	3.0			
Improve reflex	8	2.6			
Making decisions and performing quickly	8	2.6			
Earn money	5	1.7			
communication	4	1.3			
Total	**302**	**100**		**320**	**100**

Table 13 shows that while the percentage of positive opinions in this table analysis was 48.6% (f=302), the ratio of negative opinions was 51.4% (f=320). When the positive opinions are examined, the most frequently stated ideas are themes to do with relieving stress, eliminating boredom, to 21.5% (f=65) and having fun or taking enjoyment 18.5% (f=56) also stated that playing digital games has helped to develop planning skills, to learn new information and to develop general cultural knowledge. A recurring negative theme however was related to

wasting time 62.8% (f=201). In addition, students reported physical symptoms from overexposure such as eye fatigue and headache and increased propensity to stress, as well as the general theme that overuse contributed to increased addiction. The following illustrate the themes of the responses to the open-ended questions regarding student views on the positive and negative aspects of playing digital games:

"Filling time, forget the stress and focus on one thing."

"[Playing digital games] allows me to fill time, forget my stress and focus on one thing."

"I play for stress. If my day is too busy, I play to empty my head."

"I play to de-stress. If my day has been very busy, I play in order to clear my head."

"Increased my imagination skills, increased my reflex strength."

"[Playing digital games] has expanded my imaginative skills and improved my reflex responses."

"Personal development language development, creativity, entertainment, analytical thinking, stress relief."

"[Playing digital games] has improved my language skills, my analytical thinking skills, and my creativity while I play for stress relief and entertainment."

"Loss of time, addiction, antisociability, loss of physical fitness/posture problems."

"Addiction, wasting time."

Table 14. *The effect of digital games on social life*

Social experience	f	%
Not affect	121	47.3
Affects negatively	51	19.9
Affects positively	26	10.2
To break away from life, from the family	18	7.0
Developing social relations and recognizing new people	14	5.5
Causes antisocial	14	5.5
Communication problems	12	4.7
Total	256	100

As Table14 illustrates,47.3% of the students stated that digital games had no effect on their social lives, while 19.9% (f=51) stated that playing games affected their social lives negatively and 10.2% that it affected their social lives positively.These students stated that digital games helped them to develop social relations and to meet new people, while those with more negative opinions stated that they caused problems related to life, environment, family, and communication.Themes related to student views on the effect of digital games on social life:

"*I isolate myself from my physical environment as I become more addicted to the game."*

"Loss of social life, becoming addicted to the home environment, spending less time with friends."

"Sometimes we can act in the same way as the characters in digital games do in our own social life."

"It did not cause any problems in my social life.

Table 15. *Impolite or inappropriate behaviours provoked by playing digital games*

Inappropriate behaviours	f	%
Profanity and slang words/nastier behaviour	93	52
Unnecessary and inappropriate ads/videos/messages	27	15.1
Insulting/humiliating statements/accusation	25	14
Violence/aggression	15	8.4
Getting angry	15	8.4
Loud noises	4	2.2
Total	179	100

According to Table15, the students stated that they encountered while playing digital game most profanity and slang words/nastier behaviours 52% (f=93), followed with unnecessary and inappropriate ads, videos, messages 15.1% (f=27) and insults, humiliating expressions, accusations 14% (f=25).Themes related to inappropriate behaviours that students face when playing digital games:

"Sometimes players I do not know personally behave inappropriately online, and, violence-related games often seem to encourage violence."

"[Online games can inflate the] ego, [and encourage] poor communication. Also, younger age groups feel too free in these environments."

"Inappropriate words related to ambition developing from competition [are often used]."

"People [often] swear, [or are] offensive."

Discussion and Conclusion

One of the primary goals of education is to educate people to be able to overcome the academic and social problems that they may face during their lives (Charles and Lester, 1982, Şahin, 2004). Technological developments, achange in the social, political and economic structures are making for an increasingly complex world for individuals to navigate and increasing the problems individuals face throughout their lives. Accordingly, improving individuals' problem-solving skills has gained importance. To this end, this study has focused on students and their relationship with digital games. As we have seen, the study focused on individual's frequency of play, their reasons for playing, the types of games they played, theirdigital addiction and their perception of their own ability to cope with interpersonal problems. The study determined that the majority of the students who participated in the research played digital games and played these games mainly for fun, pleasure or enjoyment, to fill their leisure time and to destress. In terms of popular genres of games, it was determined that students preferred to play tactical action games, sports games and puzzle games, particularly of the first-person shooter type. Pala and Erdem (2011) made a similar study, have determined that university students play digital games in order to experience excitement, visuality and proximity to real-life, develop a strategy, they also found that students mostly first and third-person shooter and race type played real-time games. Also they determined that students who play real-time games choose these games because of excitement and visual-current-real-life proximity, while students who play all-time games prefer it because of their proximity to strategy, sports-competition, and visual-current-real life.

The study has shown that the digital addictions levels of those students who play digital games are at a medium level; in terms of sub-dimensions, the level of dependence to the digital device is high, and the students'perceptions of their own interpersonal problem-solving skills is moderate. There was no significant difference between the students' digital addiction and interpersonal problem-solving skill levels according to the type and duration of play. These results contrast with those found by Yang (2012), whoin a similar study that focused on classroom-based digital game use among young people found that students' problem-solving

skills and motivation levels were positively affected by using digital games within a learning context. The discrepancy can be accounted for by the educational purpose of the game Yang (2012) focused the study, which was designed to develop those skills directly. In a similar study, Eseryel, Ge, Ifenthaler and Law (2016) found that educational multiplayer digital games improve students' complex problem-solving skills.Just as was indicated in the present study's results, this study found a gender gap in terms of propensity to digital addiction, with female students who play three or more hours per day display higher levels of digital addiction than males do. Elsewhere in the literature, one study investigating smartphone addiction also found that women were more prone to digital addiction than men (Deursen, Bolle, Hegner and Kommers, 2015). On the other hand Kesici (2020) determined that gender (in case of being male) affect digital game addiction negatively in high school students.

Turning to the present study, the perceptions of Archaeology students about their own interpersonal problem-solving skills were found to be more positive than those who studied Nursing or Recreation, with students from the Biology department likewise more positive about their own problem-solving skills in this area than those from the Recreation department. Students studying at the Faculty of Education had a more positive impression of their interpersonal problem-solving skills thank those studying in the Faculty of Health Sciences; however, there was no significant difference between the levels of digital addiction. Especially Archaeology department and Education department consist mostly of students with emotional intelligence. According to Schutte et al. (2001) students with high social skills had higher levels of emotional intelligence, exhibited more cooperative behaviours, and were more successful in close emotional and social relationships. Furthermore, emotional maturity can be defined as the ability of the individual to understand his / her own feelings, to organize the life level of the person ahead and to empathize for the emotions of others (Schutte et al., 2001). In this context, Cetinkaya and Alparslan (2011) have determined a positive significance between sub-dimensions of emotional intelligence (mental, emotional, behavioural dimensions) and communication skills.

It has been determined that the level of addiction of the students studying in philosophy is higher than the coaching and biology department. Addiction levels were determined that students in philosophy, nursing and sports management departments higher than the biology department in the sub-dimension of overuse, philosophy department is higher than recreation and biology in the sub-dimension of non-resistant, midwifery and Turkish teachers departments is higher than recreation in the sub-dimension of dependence. Şimşek, Elciyar and Kızılhan (2019) found

different levels of addiction in students studying in different departments of universities. Differently, in a study researchers compared “Educational Use of Internet Self-Efficacy Beliefs” and “Internet Addiction” among university students in different departments in school of education and they found no meaningful relationship among the different departments (Şahin, Aydın and Balay, 2016)

Between the interpersonal problem-solving skills scale and digital addictionscale and the sub-dimensions of the digital addiction scale were generally found to be a positive and moderate significant relationship. Thus, it can be concluded that the less addicted an individual is to digital devices or games, the better their interpersonal problem-solving skills are. One conclusion we can take from this finding is that individuals who find it difficult to solve problems with others may be trying to meet their socialization and entertainment needs in a virtual environment and, as a result,are more at risk of becoming addicted to digital games. In a similar study Şahin, İbili, and Uluyol (2017), determined that there was an opposite relationship between pre-service teachers' internet addiction and their problem solving tendencies. In a study which examined the relationship between adolescents’ psychological needs and game addictions, Dursun and Eraslan-Capan (2018) placed emphasis on the importance of autonomy, which they defined as including self-confidence, a personal belief in being able to control their own life choices, the ability to regulatebehaviour, emotions and cognitions, and found that individuals with high levels of autonomy had low game addiction. Also, Bhagat, Jeong, and Kim (2020) determined that loneliness, interpersonal incompetence, need for online social interaction and low self-regulation influence the extent of digital game addiction. Similarly, Whang, Lee and Chang (2004) found that individuals with internet addiction were escapist and looking for ways to avoid dealing with the real world while those who fostered a greater number of real-world bonds and associations were less likely to suffer from digital addiction.

According to the results of this study, there is a relatively even split between the positive and negative opinions of the students towards digital gaming. When positive opinions are examined, the students repeatedly emphasizethat digital game can help to relieve stress and boredom and provide fun and enjoyment within one’s free time. The students also highlighted that digital games help them to unwind during their leisure time while at the same time help them to develop strategy and planning skills, learn new information and develop general cultural knowledge. In a similar study by Ar Rosyid et al.(2019) determined that online games contributed to the student's psychological state, emotional level, time management, and also problem-solving

ability. Furthermore digital games could be a factor to improve learning, attention and visuality (Bozkurt, 2014). Otherwise, one of the repeatedly stressed negative opinions on gaming was that playing digital games wastes time. The reviewed literature shows thatindividuals,who regularly play computer games tend to spend less time with their families, prefer to get away from their family environment, avoid face-to-face communication (Kuzu, Odabası, Eristi, Kabakcı and Kurt, 2008) and postpone their daily activities. This can result in deterioration in academic attainment (Amatem, 2008). The students in our study also reported that overusing digital games frequently caused them problems such as eye fatigue, headache, stress and increasingly addictive behaviours. Their comments echo the findings of Mustafaoğlu and Yasacı (2018) who reported that playing digital games can cause physical and mental health problems such as anxiety, aggressive attitude and depression, mental and musculoskeletal problems, dryness, redness and pain of the eyes and deterioration in sleep quality. In this way, the findings of our study support the previous work done in the field of the psychological effects of digital gaming.

The students also indicated that they frequently encountered swearing and slang words, disrespectful behaviours, unnecessary and inappropriate advertisements, videos, and messages. Despite these results, the rate who reported positive opinionsin terms of digital games and those who reported negative opinionswas closed together. The fact that the positive and negative opinions are similar to each other revealed that digital gaming addiction did not affect the social lives of the individuals and had no effect on the problem solving skills. Groves and Anderson (2015) stated that even though video games have negative effect on individuals, they also have tremendous potential for positive outcomes. Whereas violent video games increase aggression and decrease prosocial outcomes, prosocial video games increase positive interpersonal relations (Greitemeyer and Mugge, 2014). For example, according to a study, playing fast-paced video games may have positive effects on a number of visual and spatial skills, such as faster visualreaction times, and improved target localization and mental rotation (Achtman et al., 2008). Finally, digital game can be a device to improve hand motor skills, as well described in the study of Rosser et al. (2007) that demonstrated important hand skills in laparoscopic surgeons who play video game.

Our results suggest thatthe use of digital games, which are becoming more common among individuals of all ages, has both positive and negative consequences. Digital games can be perceived as negative in terms of wasting time and the development of bad habits which can adversely affect an individual’s physical and psychological health. Our study supports the

widespread assumption that intensive gaming has a negative impact on players' social lives and interpersonal communication. Our results also support the idea that the development of digital addiction increases in likelihood when digital games are played frequently and that this level of addiction can cause physical-psychological problems in individuals. In order to counteract this addictive effect, one suggestion we can make from the findings of this study is that gaming manufacturers could be encouraged to develop more educational platforms for gaming and that the huge budgets digital games currently command could be siphoned off into developing teaching and learning tools that capture the imagination and help develop authentic problem solving skills. To this end, E-sport or digital game lessons couldbe included on the university curriculum as elective courses or recreational courses. Moreover, raising awareness about the pitfalls of developing digital addiction through topics integrated into student degree should be recommended, particularly focussing on psycho-social subjects and digital game usage skills in the hope that this knowledge will enable students to mitigate any of their own addictive behaviours.

Using of the internet in education within a reasonable time can have a positive effect to improve certain skills without being dependent on the digital game. Nevertheless, the authors still maintain that if individuals can adapt their ability to solve the problems they face during the digital game into the challenges they face in their daily life, then digital gaming practices may also have a positive impact on problem-solving ability. In the future, whilethis study was based solely on students' perceptions, we suggest for further study that the parameters should be extended toobservational and experimental studies and scales based on parent and peer notification or psychological tests can be used.

References

Aarseth E., Bean A., Boonen H., Colder Carras M., Coulson M., Das D., et al. (2017). Scholars' open debate paper on the world health organization ICD-11 gaming disorder proposal.*Journal of Behavioral Addictions 6(3),* 267–270. DOI: 10.1556/2006.5.2016.088

Achtman, R. L., Green, C. S., & Bavelier, D. (2008). Video games as a tool to train visual skills. *Restorative Neurology and Neuroscience*, *26*,435-446.

Alver B. (2005). Üniversite öğrencilerinin problem çözme becerileri ve akademik başarilarinin çeşitli değişkenlere göre incelenmesi.*M.Ü. Atatürk Eğitim Fakülteleri Eğitim Bilimleri Dergisi, 21,* 75-88.

Amatem, (2008). *Bilgisayar ve internet*. Ankara*:*Amatem Yayınları.

Anlıak, Ş. and Dinçer, Ç. (2005). The evaluation of the interpersonal problem solving skills of the children attending to the preschools applying different educational approaches. *Ankara Üniversitesi Eğitim Bilimleri Fakültesi Dergisi, 38 (1),* 149-166.

Ar Rosyid, H., Prawidya, D. M., Fajariani, E., Adhilaga, H., & Amalia, A. (2019).The online game addiction psychology and interpersonal relationship of the engineering students. *Bulletin of Social Informatics Theory and Application, 3(2),* 75-79. https://doi.org/10.31763/businta.v3i2.88

Aydoğdu Karaaslan, İ. (2015). Dijital oyunlar ve dijital şiddet farkındalığı: Ebeveyn ve çocuklar üzerinde yapılan karşılaştırmalı bir analiz. *Uluslararası Sosyal Araştırmalar Dergisi, 8(36),*806-818.

Bhagat, S., Jeong, E.J. & Kim,D.J. (2020) Therole of individuals' need for online social interactions and interpersonal incompetence in digital game addiction. *International Journal of Human–Computer Interaction, 36(5),* 449-463, DOI: 10.1080/10447318.2019.1654696

Bayırtepe, E. ve Tüzün, H. (2007).Oyun-tabanlı öğrenme ortamlarının öğrencilerin bilgisayar dersindeki başarıları ve öz- yeterlik algıları üzerine etkileri (The effects of game-based learning environments on students' achievement and self-efficacy in a computer course). *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, 33*, 41-54.

Bingham, A.(1998). *The development of problem solving skills among children,* Vol. 4, Translated by Dr. Ferhan Oğuzkan. Istanbul: MEB Publishing.

Bozkurt, A. (2014). Homo Ludens: Dijital Oyunlar ve Eğitim. *Eğitim Teknolojileri Araştırmaları Dergisi, 5(1),* 1-21.

Büyüköztürk, Ş. (2004). *Sosyal bilimler için veri analizi el kitabi*. Ankara: Pegem A Yayıncılık.

Cardoso-Leite, P. & Bavelier, D. (2014). Video game play, attention, and learning: How to shape the development of attention and influence learning*? Curr Opin Neurol, 27(2).*185-191. DOI:10.1097/WCO.0000000000000077.

Collins, A., Brown, J. & Newman, S. (1989). Cognitive Apprenticeship: Teaching the crafts of reading, writing, and mathematics. In L.B. Resnick (Ed.) *Knowing, Learning, and Instruction: Essays in honor of Robert Glaser*. Hillsdale, NJ: Erlbaum Associates

Çakır O., Ayas T., &Horzum M.B. (2011). An investigation of university students' internet and game addiction with respect to several variables. *Ankara UniversityJournal of Faculty of Educational Sciences, 44(2),* 95-117. https://doi.org/10.1501/Egifak_0000001226

Cetinkaya, O.veAlparslan, AM.(2011). Duygusal zekânin iletişim becerileri üzerine etkisi: Üniversite öğrencileri üzerinde bir araştırma (the effect of emotional intelligence on communication skills: An investigation on university students). *The Journal of Faculty of Economics and Administrative Sciences, 16(1),*363-377.

Deursen, A.J.A.M., Bolle, C.L., Hegner, S.M. & Kommers, P.A.M. (2015). Modeling habitual and addictive smartphone behavior: The role of smartphone usage types, emotional intelligence, social stress, self-regulation, age, and gender. *Computers in Human Behavior,45,* 411-420.https://doi.org/10.1016/j.chb.2014.12.039.

Dursun, A. ve Eraslan-Çapan, B. (2018). Ergenlerde dijital oyun bağimliliği ve psikolojik ihtiyaçlar(Digital game addiction and psychological needs for teeanergers). *İnönü University Journal of the Faculty of Education, 19(2),* 128-140 DOI: 10.17679/inuefd.336272

Eseryel, D., Ge, X., Ifenthaler, D. & Law, V (2016). Dynamic modeling as a cognitive regulation scaffold for developing complex problem-solving skills in an educational massively multiplayer online game environment. *Journal of Educational Computing Research, 45(3),* 265-286. https://doi.org/10.2190/EC.45.3.a

Greening L. (1997). Adolescent stealers' and nonstealers' social problem solving skills. *Adolescence,32,* 51-55.

Greitemeyer, T.& Mügge, DO. (2014).Video games do affect social outcomes: a meta-analytic review of the effects of violent and prosocial video game play. *Pers Soc Psychol Bull., 40(5),* 578-89.doi: 10.1177/0146167213520459.

Griffiths, MD. (2002). The educational benefits of videogames. *Education and Health, 20(3),* 47–51.

Gros, B. (2003). The impact of digital games in education. First Monday, 8(7). Disponível em.

Groves, C. L., & Anderson, C. A. (2015). The negative effects of video game play. In R. Nakatsu, M. Rauterberg, & P. Ciancarini (Eds.), *Handbook of Digital Games and Entertainment Technologies*. Springer.

Hazar, Z. (2019). An analysis of the relationship between digital game playing motivation and digital game addiction among children. *Asian Journal of Education and Training, 5(1),* 31-38. DOI: 10.20448/journal.522.2019.51.31.38

Hong, J., Cheng, C., Hwang, M., Lee, C. & Chang, H. (2009). Assessing the educational values of digital games. *Journal of Computer Assisted Learning, 25,* 423-437.doi:10.1111/j.1365-2729.2009.00319.x

Karasar, N. (2012). *Bilimsel araştırma yöntemi.* Ankara: Nobel Yayın Dağıtım.

Kesici, A . (2020). The effect of conscientiousness and gender on digital game addiction in high school students. *Journal of Education and Future, (18),* 43-53. DOI: 10.30786/jef.543339

Kesici, A.& Tunç, N.F. (2018). The development of the digital addiction scale for the university students: Reliability and validity study. *Universal Journal of Educational Research, 6* , 91 - 98. doi: 10.13189/ujer.2018.060108.

Kim M. & Wong S.S.H. (2020). Trust worthiness challenge in children's environmental problem solving in the digital era. In: Teo T., Tan AL., Ong Y. (Eds) *Science Education in the 21st Century.* Springer, Singapore. https://doi.org/10.1007/978-981-15-5155-0_9

Korkut F. (2002). Lise ögrencilerinin problem çözme becerileri (Problem solving skills of high school students. *Hacettepe Universtiy Journal of Education, 22,* 177-184.

Kuzu, A., Odabaşı, F., Erişti, S. D., Kabakçı, I. ve Kurt, A. A. (2008). İnternet kullanımı ve aile araştırması. *TC Başbakanlık Aile ve Sosyal Araştırmalar Genel Müdürlüğü Yayınları.* Ankara, Türkiye.

Lemmens, J.S., Valkenburg, P.M. & Peter, J. (2009). Development and validation of a game addiction scale for adolescents.*Media Psychology, 12(1),*77-95. https://doi.org/10.1080/15213260802669458

Mustafaoğlu, R ve Yasacı, Z. (2018). Dijital oyun oynamanın çocukların ruhsal ve fiziksel sağlığı üzerine olumsuz etkileri (The negative effects of digital game playing on children's mental and physical health). *Journal of Dependence, 19(3),* 51-58.

Myrick RD. (1993). *Developmental guidance and counseling: A practical approach.* 2nd Ed. Educational Media Corporation.

Özsoy, S. ve Özsoy, G. (2013).Eğitim araştırmalarında etki büyüklüğü raporlanması (Effect size reporting in educational research). *Elementary Education Online,* 12(2), 334-346.

Pala, F.K. ve Erdem, M. (2011). Dijital oyun tercihi ve oyun tercih nedeni ile cinsiyet, sınıf düzeyi ve öğrenme stili arasındaki ilişkiler üzerine bir çalışma.*Ahi Evran Üniversitesi Eğitim Fakültesi Dergisi, 12(2),* 53-71.

Rosser,I. C., Lynch, P. J., Cuddigy, L., Gentile, D. A., Klonsky, J., & Merrell, R. (2007). The impact of video games on training surgeons in the 21st century. *Archives of Surgery, 142,* 181-186.

Sahin, C., Aydin, D. ve Balay, R. (2016). Eğitim fakültesi öğrencilerinin eğitsel internet kullanımı ile internet bağımlılıklarının incelenmesi (The investigation of the students' educational use of ınternet and students' internet addiction in school of education). *Ahi Evran Universitesi Kırsehir Egitim Fakultesi Dergisi (KEFAD), 17(1),* 481-497.

Şahin Ç. (2004). Problem çözme becerisinin temel felsefesi. *Kazım Karabekir Eğitim Fak. Der. 10, 160-171.*

Şahin, S , İbili, E , Uluyol, Ç . (2017). Öğretmen adaylarında problem çözme eğilimi ve internet bağımlılığı ilişkisinin incelenmesi . Afyon Kocatepe Üniversitesi Sosyal Bilimler Dergisi, 19(1),1-21. https://dergipark.org.tr/tr/pub/akusosbil/issue/ 31874/347006

Sahin, N., Sahin, N. & Heppner, P. P. (1993). Psychometric properties of the problem solving inventory in a group of Turkish university students. *Cognitive Therapy and Research, 17,* 379-396.

Savcı, M. & Aysan, F. (2017). Technological addictions and social connectedness: Predictor effect of internet addiction, social media addiction, digital game addiction and smartphone addiction on social connectedness. *Journal of Psychiatry and Neurological Sciences, 30 (3),* 202-216. DOI:10.5350/DAJPN2017300304

Schutte, NS., Malouff, JM., Bobik, C., Coston, TD., Greeson, C., Jedlicka, C., Rhodes, E.& Wendorf, G.(2001). Emotional intelligence and interpersonal relations. *J Soc Psychol, 141(4),*523-36.

Şimşek, A., Elçiyar, K. & Kızılhan, T. (2019). A comparative study on social media addiction of high school and university students. *Contemporary Educational Technology, 10(2),* 106-119. DOI: https://doi.org/10.30935/cet.554452

Tatlı, Z. (2018). Traditional and digital game preferences of children: A CHAID analysis on middle school students. *Contemporary Educational Technology, 9(1),* 90-110

TUİK, (2018). TÜİK'in İstatistiklerle Gençlik 2018 raporu.https://www.bik.gov.tr/tuikin-istatistiklerle-genclik-2018-raporu-aciklandi/#:~:text=Gen%C3%A7lerin%20internet%20kullan%C4%B1m%20oran%C4%B1%20y%C3%BCzde%2093'e%20%C3%A7%C4%B1kt%C4%B1&text=%C4%B0nternet%20kullan%C4%B1m%20oran%C4%B1%202018'de,artarak%20y%C3%BCzde%2089'a%20y%C3%BCkseldi. Erişim tarihi: 20.7.2019

TUİK, (2020). 2020 hanehalkı bilişim teknolojileri (BT) kullanım araştırması. https://www.alomaliye.com/2020/08/25/2020-hanehalki-bilisim-teknolojileri-bt-kullanim-arastirmasi/ Erişim tarihi: 5.9.2020

Türkiye Bilişim Derneği, (2017). *Değerlendirme raporu.* http://www.tbd.org.tr/wp-content/uploads/2018/05/2017-degerlendirme-raporu.pdf

Wan, C.-S., & Chiou, W.-B. (2006). Why are adolescents addicted to online gaming? An interview study in Taiwan. *CyberPsychology & Behavior, 9(6),* 762–766. DOI:10.1089/cpb.2006.9.762

Whang, L.S. M., Lee, S. &Chang, C. (2004). Internet over-users' psychological profiles: A behavior sampling analysis on internet addiction. *CyberPsychology & Behavior, 6(2), 143-150.* https://doi.org/10.1089/109493103321640338

Yalcın Irmak A. ve Erdogan S. (2016). Ergen ve genç erişkinlerde dijital oyun bağımlılığı: Güncel bir bakış (Digital game addiction among adolescents and younger adults). *Türk Psikiyatri Dergisi 2016, 27(2),* 128-37.

Yang, Y.C. (2012). Building virtual cities, inspiring intelligent citizens: Digital games for developing students' problem solving and learning motivation. *Computers & Education, 59(2),* 365-377. https://doi.org/10.1016/j.compedu.2012.01.012.

Young, K. S. (2004). Internet addiction a new clinical phenomenon and its consequences. *American Behavioral Scientist, 48(4),* 402-415.

Yüksel, Ç. (2008). *Üniversite öğrencilerinin kişilerarası ilişkilerinde yaşadıkları problemleri çözme becerilerinin belirlenmesi*. Yayınlanmamış Yüksek Lisans Tezi, Selçuk Üniversitesi Sosyal Bilimler Enstitüsü, Konya.