

Investigation of Digital Game Addiction, Academic Procrastination and Autonomous Learning in Secondary School Students (Konya Case)*

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Abstract

This study was conducted to examine the relationship between digital game addiction level, academic procrastination behaviors and autonomous learning levels of students studying at the second level of primary education. The study group of the research consisted of 5th-8th grade students studying in Kulu district of Konya in the 2021-2022 academic year. The Digital Game Addiction Scale (DGAD-7), Academic Procrastination Scale (APS) and Autonomous Learning Scale (ALS) were used to collect the data. A total of 416 students, 230 girls and 186 boys, participated in the study. Mean, standard deviation and Pearson Correlation analysis were used to analyze the data. As a result of the analysis, the average score obtained from the Digital Game Addiction scale revealed that the students were not at the level of addiction and had an average score below the middle level. It was determined that the students showed a moderate level of procrastination behavior and considered themselves adequate and good in autonomous learning. There was a significant relationship between students' Digital Game Addiction Scale scores and Academic Procrastination Scale and Autonomous Learning Scale scores and Autonomous Learning Scale sub-dimensions scores. At the end of the study, it was suggested that more practices that support student autonomy should be included in learning environments, the time to be devoted to digital games should be reduced by making a daily plan, and children, parents and teachers should be informed through seminars, public service announcements, TV series or social media.

Keywords: Digital Game, Addiction, Academic Procrastination, Autonomous Learning, Primary School Level II

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In our age of rapid development and transformation, technology affects education as much as it does all areas of life. Increasing educational technology support in the learning-teaching process (smart boards, videos, animations, simulations, educational content applications and pages, etc.), facilitating access to information with the widespread use of the internet, and developing students' researcher aspects more are some of the remarkable developments. With the impact of the pandemic period, the relationship of children, teachers and parents with technology has had to increase even more. In addition to the many benefits of technology, it can also have negative effects such as prolonged screen time, exposure to cyberbullying while playing games, privacy of personal information, health problems (obesity, decreased mobility, sleep-related disorders), nervousness and decreased academic achievement, socialization problems, addiction (internet, social media, games, etc.) (Martin, 2011).

Today, various types of behavioral addictions have emerged with technological developments. Digital game addiction is a type of addiction that is frequently seen recently. Especially children and adolescents are considered to be in the risk group in digital game addiction. In the Diagnostic and Statistical Manual of Mental Disorders of the American Psychiatric Association (APA), the diagnostic criteria for computer game addiction are as follows: mental preoccupation with the game, withdrawal symptoms, tolerance, loss of control, decreased interest in other activities, continued use despite negative consequences, lying, mood changes, decreased functionality in friendship, work and other important areas of life (APA, 2013).

Digital game addiction has increased even more during the pandemic. During the emergency distance education process, children had to use the internet and a device to continue their education. During this period, especially children and young people became more involved with the digital world. Digital materials, which were given for limited periods of time and in a more controlled manner before the pandemic, were made available to children in a less controlled manner during the pandemic period. At this point, imposing sanctions on the child can build virtual walls between the child in adolescence and the parents and direct him/her to the digital world, virtual friendships, withdrawal, miscommunication, problems in the relationship with parents, psychological problems, and loneliness (Göldağ, 2020). Individuals may face material and moral problems as a result of violence, sexual abuse, smoking and alcohol encouragement, sociality, crimes such as theft, theft of confidential and private information (Information and Communication Technologies Authority, 2019).

In the Digital Gaming Sector Report (Ankara Development Agency, 2016) and the Digital Game Addiction Workshop (Ministry of Health, 2018), some conclusions were reached about digital games. According to the results of the reports, although digital games have positive aspects, the number of negative aspects and their impact on the path to addiction are quite high. The problems frequently mentioned are loneliness, depression, suicide, work inefficiency, fatigue, insomnia, more attachment, and inability to break away from the game, inactivity, failure in work, lack of discipline, negative impact on academic success for students, and indifference to lessons with failure, and then reluctance to school. Aktaş and Bostancı (2021) found in their study that there was a significant difference in terms of change in the duration of playing digital games during the pandemic period, and that university students with an addictive habit increased their digital game playing time in this process (58.4%).

Due to digital game addiction, children are unable to fulfill some of their responsibilities and use time efficiently and effectively. Too much screen time may cause students to postpone their academic work and tasks. A student who procrastinates academically cannot or believes that he/she cannot do his/her homework or responsibilities due to lack of time, energy, and motivation, and as a result, a perception of inadequacy is formed in the individual (Akdemir, 2013). This leads to a decline in academic achievement, reluctance to study and school, and can be the beginning of the end leading to dropping out of school or education. One of the factors that cause students to postpone their tasks is the problems they experience in managing their learning. An autonomous student who takes responsibility for his/her learning throughout the learning process can be defined as an individual who can make his/her own choices, actively participates in the learning process, questions, thinks critically, research, thinks scientifically, is curious, expresses himself/herself accurately and clearly, strives for personal development, and feels responsible for what are called 21st century skills (Littlewood, 1999). As students' autonomy increases, it is predicted that academic procrastination and digital game addiction will decrease.

Secondary school students were selected for this study. This period was found to be important because it is the period of adolescence, it is different from the first level of primary education in terms of thinking structure, number, and content of courses, it is the basis for transition towards high school, emotional differences, psychological factors, and the stage for decisions and events that will affect future life. Considering that children in this age group are highly influenced by role models, the importance of the research emerges. In this study, it was tried to determine the relationship between digital game addiction, academic procrastination and autonomous learning levels and the relationship between these variables in a period when second level primary school students were affected by the pandemic. It is thought that the results of this study will provide tips and ideas to parents, secondary school students, teachers, administrators, guidance studies, and guidance services in schools. Identifying and intervening in digital game addiction at an early age is of great importance in terms of eliminating addiction, preventing academic procrastination that affects students' academic success and ensuring autonomous learning.

The main purpose of this study is to determine the levels of digital game addiction, academic procrastination and autonomous learning of students studying at the second level of primary education and to investigate the relationships between these variables. To achieve this main purpose, answers to the following questions were sought:

- What is the level of digital game addiction, academic procrastination and autonomous learning of second level primary school students?
- Is there a relationship between digital game addiction level, academic procrastination and autonomous learning?

Method

In the study, the relational survey model was used to reveal an existing situation and to reach findings about it. Survey research are studies in which the views of the participants on a subject or event or their interests, skills, abilities, attitudes, etc. are determined and

usually involve a larger sample than other models (Büyüköztürk, Çakmak, Akgün, Karadeniz, & Demirel, 2016, p.177). In this study, the relationships between digital game addiction, academic procrastination and autonomous learning were examined.

Population and Sample

In this study, the population of the research consists of students studying in the second level of primary education affiliated to the Ministry of National Education in Kulu district of Konya province in the 2021-2022 academic year. In this context, 2015 students studying at the second level of primary education in Kulu district as of 2022 were included in the population of the study (Kulu District Directorate of National Education, 2021). Since the study aimed to reveal the general situation of the students in the second level of primary education in Kulu district, the typical case sampling method was used. In determining the sample size for the students in the study, Cohen, Manion and Morrison's (2005) sample size table, which is based on the relationship between sampling error and confidence level, was used. According to the table, it was assumed that a target population of 2015 people would be represented by at least 322 people for a tolerable 5% error according to 95% confidence level. Accordingly, data were collected from 416 students studying in three secondary schools in the district center. These schools were selected because they represent typical schools in Konya province. Information about the students from whom data were collected is presented in Table 1.

Table 1

Personal Findings Related to Students

Personal Information	Group	N	%
Gender	Girl	230	55,3
	Male	186	44,7
Classroom	5	101	24,3
	6	119	28,6
	7	91	21,9
	8	105	25,2
School	A Middle School	84	20,2
	B Middle School	116	27,9
	C Middle School	216	51,9

According to Table 1, 55.3% (230) of the students were female and 44.7% (186) were male. 24.3% (101) of the students were in the fifth grade, 28.6% (119) in the sixth grade, 21.9% (91) in the seventh grade and 25.2% (105) in the eighth grade. 20.2% (84) of the students were studying in A Secondary School, 27.9% (116) in B Secondary School and 51.9% (216) in C Secondary School.

Data Collection Tools

In the study, the relationship between digital game addiction, academic procrastination, and autonomous learning of second level primary school students was examined. For this purpose, the data collection tools used in the study are as follows:

Digital Game Addiction Scale (DGAS-7)

"Digital Game Addiction Scale" developed by Lemmens et al. (2009) and adapted into Turkish by Irmak and Erdoğan (2015) was used to determine the level of digital game addiction. The scale consists of 7 items in five-point Likert type. A minimum of 7 and a maximum of 35 points can be obtained from the scale. Since the DOBÖ-21 scale, which includes 21 items and 7 sub-dimensions, was shortened and adapted to 7 items, it was named DOBÖ-7. The validity and reliability Cronbach's Alpha value of the DOBÖ-7 scale is 0.92. According to the answers given, the increase in the average score indicates the level of game addiction of the participants. Within the scope of this study, the Cronbach Alpha reliability coefficient of the Digital Game Addiction Scale was calculated as 0.69. In the context of this value, it can be said that the scale is reliable.

Academic Procrastination Scale (APS)

To determine students' academic procrastination behaviors, the Academic Procrastination Scale developed by Çakıcı (2003) to determine students' academic procrastination behaviors was used in the study. The scale consists of a total of 19 items, including 12 negative (2, 3, 5, 6, 8, 10, 12, 14, 16, 18, 19), 7 positive (1, 4, 7, 9, 11, 13, 17) and 12 negative (2, 3, 5, 6, 8, 10, 12, 14, 16, 18, 19) items about the tasks that students are responsible for in their educational life (such as studying, preparing for exams, preparing projects). The responses to the statements in the scale represent a five-point Likert scale as "5 = reflects me completely", "4 = reflects me mostly", "3 = reflects me a little", "2 = reflects me very little", "1 = does not reflect me at all". The highest score that can be obtained from the scale is 95 and the lowest score is 19. A high score on the scale indicates that students are academic procrastinators. The Cronbach Alpha reliability coefficient of the Academic Procrastination scale was calculated as 0.92 (Çakıcı, 2003). Within the scope of the research, the Cronbach Alpha reliability coefficient of the Academic Procrastination scale is 0.62. In the context of this value, it can be said that the scale is reliable.

Autonomous Learning Scale (ALS)

Within the scope of the study, the 12-item Autonomous Learning Scale developed by Macaskill and Taylor (2010) and adapted into Turkish by Arslan and Yurdakul (2015) was used to determine students' autonomous learning scores. Students fill in the statements by marking one of the appropriate numbers between 1-5 on a 5-point Likert scale. The scale has two sub-dimensions: independent learning and study habits. There are 7 items in the Independent Learning dimension (basic characteristics in autonomous learning; responsibility for learning, openness to experience, intrinsic motivation and self-confidence in coping with new activities) and 5 items in the Study Habits dimension (studying and learning such as time management, procrastination, attitude of working alone). The autonomous learning score is obtained by summing the scores obtained from here. The higher the score obtained from the autonomous learning scale, the higher the degree of autonomous learning of the individual. The Cronbach Alpha internal consistency reliability coefficient of the scale was obtained as .80 for the total score (Arslan & Yurdakul, 2015). Within the scope of the study, the Cronbach Alpha reliability coefficient of the Autonomous Learning Scale was calculated as 0.80 for the overall scale, .71

for the independent learning sub-dimension and .62 for the study habits sub-dimension. In the context of these values, it can be said that the scale is reliable.

Analyzing the Data

Statistical Package for the Social Sciences (SPSS) 23.0 program was used to analyze the data obtained within the scope of the research. In order to determine which tests will be used in the analysis, it was examined whether the data were normally distributed. It is seen that the skewness and kurtosis coefficients obtained from the scores related to the scales are between +3 and -3. This shows that the scores related to the scale are normally distributed. Parametric test techniques were used in the analyzes. The mean, standard deviation, minimum and maximum values of the Digital Game Addiction Scale (DGO-7), Autonomous Learning Scale (ALS) and its sub-dimensions, and Academic Procrastination Scale (APS) were included. In addition, Pearson Correlation analysis was conducted to determine the relationship between students' digital game addiction level, academic procrastination and autonomous learning. The significance level was taken as 0.05 within the scope of the research.

Findings

In this section, digital game addiction, academic procrastination and autonomous learning levels of middle school students are presented, and then the relationships between these three variables are examined.

Findings on Students' Digital Game Addiction, Academic Procrastination and Autonomous Learning Levels

Findings regarding students' digital game addiction, academic procrastination and autonomous learning levels are given in Table 2.

Table 2

Findings Related to Digital Game Addiction, Academic Procrastination and Autonomous Learning Levels

Scales and Subscales		Minimum	Maximum	X	S
Digital Game Addiction Scale	16	7,00	30,00	15,23	5,00
Academic Procrastination Scale	16	35,00	88,00	57,52	9,77
Autonomous Learning Scale	16	16,00	60,00	43,18	8,53
Independent Learning	16	7,00	35,00	25,23	5,34
Study Habits	16	5,00	25,00	17,94	4,07

According to Table 2, the lowest score the students received from the digital game addiction scale was 7 and the highest score was 30. In order to characterize an individual as a game addict, all items in the scale must be scored 3 or above, and individuals with a total score of 21 or above can be defined as game addicts (Irmak & Erdoğan, 2015). The average score of the students who participated in the application was 15.23. The average score obtained from

the scale indicates that there is an average score below the average level and that the students are not addicted.

According to the table, the average score of the students on the academic procrastination scale is 57.52. It is seen that the lowest score of the students in the sample is 35 and the highest score is 35. Accordingly, it can be said that the students show a procrastination behavior above the medium level. In addition, it is seen that no student received the lowest score of 19 points, in other words, almost all students have problems with academic procrastination. According to this result, it can be said that students have problems in fulfilling their responsibilities on time and in full.

It was observed that the mean autonomous learning score of the students was 43.18, which is above the average level. The lowest score of the students on the scale was 16 and the highest score was 60. Accordingly, students consider themselves adequate and at a good level in autonomous learning. It can be said that there are environments that support students' autonomy in their classes, lessons, schools and homes. While the average score of autonomous learning, one of the sub-dimensions of the scale, was 25.23, the average score in the study habits sub-dimension was 17.94. The students' high level of autonomous learning can be considered as a positive situation.

Findings on the Relationship between Students' Digital Game Addiction, Academic Procrastination and Autonomous Learning Scores

The results of the correlation between students' digital game addiction, academic procrastination and autonomous learning scores are presented in Table 3.

Table 3

The Relationship Between Students' Digital Game Addiction, Academic Procrastination and Autonomous Learning Scores

Scales	Digital Gaming		Academic Procrastination		Autonomous Learning-Total		IO-Independent Learning Subdimension		SS-Study Habits Subdimension	
	r	p	R	p	r	p	r	p	r	p
Digital Game Addiction	-	-	,209	,000*	-,329	,000*	-,267	,000*	-,338	,000*
Academic Deferral	-	-	-	-	,133	,007*	,164	,001*	,063	,197
Autonomous Learning	-	-	-	-	-	-	,929	,000*	,875	,000*

*p<0.05

According to Table 3, there is a significant relationship between students' digital game addiction scores and academic procrastination and autonomous learning total scores and sub-dimensions (p<.05). Accordingly, there is a low, positive and significant relationship between students' digital game addiction scores and academic procrastination scores (r=0.209, p<.05).

On the other hand, there is a moderate, negative and significant relationship between autonomous learning scores ($r=-0.329$, $p<.05$), independent learning ($r=-0.267$, $p<.05$) and study habits subscale scores ($r=-0.338$, $p<.05$). As the students' digital game addiction scores increase (higher scores on the scale indicate higher addiction), their academic procrastination scores also increase; as their digital game addiction scores increase, their autonomous learning, independent learning and study habits scores decrease. In other words, it can be said that there is a positive interaction between digital game addiction and academic procrastination and a negative interaction between autonomous learning. Digital game addiction negatively affects the individual's ability to take responsibility for his/her own learning, time management and planning skills with its feature of tying the individual to the screen.

Conclusion and Discussion

In this study, in which digital game addiction, academic procrastination and autonomous learning variables were examined, it was concluded that students' digital game addiction scores were close to the middle level. It is a pleasing situation that students did not have digital game addiction during and after the pandemic period. Because it is an important result that the digital addiction scale score is low in a process where children stay at home by receiving distance education due to the pandemic and technological devices are accessible.

Different results were encountered in studies conducted with different age groups during and after the pandemic period. For example, Ulaş (2022) found that children's digital game addiction levels were below the middle level in his study with middle school students. Aktaş & Bostancı (2021), in their study with university students, concluded that individuals played digital games for more time during the pandemic and preferred phones (91.1%) as a gaming tool. Similarly, Küçükvardar and Türel (2022) found that the time spent playing games increased during the pandemic in their study with university students. Güzen (2021) conducted a study with children aged 4-6 years with the support of parents and investigated the situation before and during the pandemic. In the findings of his study, he concluded that the tendency towards digital game addiction increased in the children in the group participating in the study during the pandemic process, mothers adopted tactics that directed their children to digital less than fathers, there was a positive relationship between maternal working time and digital addiction tendency scores, and boys had higher digital addiction tendency scores.

Another result obtained in the research is that students' academic procrastination behaviors are above the medium level and more than half of them postpone the given tasks. Similarly, other studies have also found that students' academic procrastination behaviors are at a moderate level (Demir, 2017; Demir & Baloğlu, 2020; Düzgün, 2022; Kara, 2019; Özer & Akay, 2020; Seyfi, 2019; Yardım, 2021).

According to another result of the study, students found themselves sufficient in autonomous learning. The high level of students' autonomous learning can be explained by the fact that teachers implement practices that support students' autonomous learning in the classroom. In addition, the fact that teachers have knowledge about autonomous learning, encourage students, and that families support students' autonomous learning by supporting them at home may have increased students' autonomous learning levels. İlman (2018) found

values close to the average score values obtained in this study. In another study, students' autonomous learning levels were at a medium level (Göksel & Adıgüzel, 2022).

A low level positive and significant relationship was found between students' digital game addiction scores and academic procrastination scale. Accordingly, as students' digital game levels increase, their level of procrastination behavior also increases. In other studies, a positive relationship was found between social media addiction and academic procrastination (Caratiquit & Caratiquit, 2023; Durdu, 2019; Kürker, 2021); between digital game addiction and academic procrastination scores (Elhatip, 2018; Kibaroglu, 2020; Zamki, 2022); between internet addiction and academic procrastination (Demir, 2017); between telephone addiction and academic procrastination (Güngör & Koçak, 2020).

Gürültü and Deniz (2017) stated that using social media for a long time may cause academic procrastination. Social media is not only a sharing space but also a platform that allows games, correspondence, communication and activities. It may be natural for children to have difficulty leaving a fun and pleasurable environment and tend to postpone other tasks. Dela Vega, Flores, and Magusib (2017) stated in their research that if there are two tasks to be completed simultaneously and a choice is to be made between them, individuals choose the task that will bring them satisfaction and pleasure.

A moderate, negative and significant relationship was found between students' digital game addiction scores and autonomous learning scale scores, independent learning and study habits sub-dimension. In other words, as digital game addiction increases, autonomous learning, independent learning and study habits scores decrease. A low, positive and significant relationship was found between academic procrastination scores and autonomous learning scores. As students' academic procrastination behavior increases, their autonomous learning level decreases.

As students' digital game addiction increases, the time they spend in front of devices such as tablets, computers, and cell phones increases. Too much time is spent in front of the screen due to videos, social media, games, etc. and the elapsed time is not realized. This uncontrollable time can cause the individual's daily lesson program to be in the background and disrupted. Since the child's physical needs (such as eating, sleeping, resting) take precedence, the time sacrificed and the events that have to be postponed are other activities such as subject repetition, exam preparation, doing homework, sleeping on time, and responsibilities at home. Jankovic, Nikolic, Vukonjanski, and Terek (2016) found in their study that students do their academic tasks, but when a time constraint needs to be made, they do so from their responsibilities and homework. Therefore, this situation reflects negatively on students' autonomous learning attitude. As a result, students' autonomy and self-management in the learning process reduces digital game addiction and academic procrastination behaviors. Therefore, autonomy behaviors should be provided to students starting from an early age.

Recommendations

According to the findings obtained in this study, the following recommendations have been developed for practice and researchers in order to give direction to those concerned and the research to be conducted on this subject.

Recommendations for Practice

- To reduce children's digital game addiction, it is recommended to limit internet use at home. Families who have difficulty in controlling children who play games can plan with their children for digital games and internet use by using limited internet connection instead of unlimited internet.
- Seminars and conferences on digital games and digital addiction can be organized at schools for teachers, students, and families. In these events, families can be informed about physical and virtual monitoring of children who play digital games (filter programs, knowing the environment of friends, tracking footprints on technological devices), taking action against problems, and establishing parent-child communication.
- Teachers should monitor students who frequently show academic procrastination behavior and investigate the underlying causes of this behavior.
- Academic procrastination can be reduced through activities in which students can experience a sense of achievement. For this reason, teachers are recommended to assign homework/responsibilities at a level that students can achieve.
- Social, sportive and cultural activities, club and community activities organized in schools can help students spend more quality time outside of school. Thus, opportunities can be created for children to spend time with peer groups in a more social environment, communicate, realize their talents and learn.
- With the support of institutions such as the Green Crescent, NGOs, Youth Centers, Ministry of Health, Ministry of Youth and Sports, more effective, fun, leisure activities can be carried out in the fight against gaming addiction.

Suggestions for Researchers

- The results of this study, which was conducted during a period that can be considered a pandemic, can be compared with the results of studies conducted after the pandemic. In particular, students' levels of digital game addiction before and after the pandemic can be examined.
- In this study, the relationship between digital game addiction, academic procrastination and autonomous learning was examined. In addition to these three variables, studies that reveal the relationships between different variables such as academic achievement, attitude, motivation, communication, self-efficacy can be conducted.
- This study was conducted with middle school students. Comparisons can be made according to age and grade by including students at different levels in the sample.
- Quantitative research methods were used in this study. In other studies, qualitative data collection tools such as observation and interviews can be used to provide more in-depth information about the situation.
- Experimental studies in which autonomous learning strategies are provided to a group of students with digital game addiction can be conducted to examine the effect on digital game addiction and academic procrastination.

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Conflict of Interest

The researchers do not have any personal conflicts with other individuals and institutions related to the research.

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Ethics Committee Decision

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