

Between play and responsibility: Digital game-playing attitudes as a predictor of learning responsibility

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Citation: Bulut, R. (2026). Between play and responsibility: Digital game-playing attitudes as a predictor of learning responsibility. *Pedagogical Research*, 11(4), em0285. <https://doi.org/10.29333/pr/19247>

ARTICLE INFO

Received: 22 Feb. 2026

Accepted: 15 Jun. 2026

ABSTRACT

This study investigates the effect of secondary school students' attitudes toward digital game playing on their responsibility for learning. Using a correlational survey model, the study was carried out with 275 students. Data were collected using the Digital Game-Playing Attitude Scale, the Learning Responsibility Scale, and a Personal Information Form. Findings indicate that male students report higher gaming attitudes than females. Gaming duration significantly differentiates attitudes; students who play 0–1 hour daily demonstrate the lowest digital game-playing attitude scores. Game type preference significantly influences digital game-playing attitudes, with students favouring war games scoring higher than those preferring sports, puzzle, or adventure games. Longer gaming duration is associated with significant differences in learning responsibility, and students who play for 0–1 hour per day exhibit the highest responsibility levels. Regression analysis revealed that each one-unit increase in digital game-playing attitude predicts a 0.42-point decrease in learning responsibility. Based on these findings, it is recommended to increase awareness of students' digital game-playing habits to support learning responsibility and to monitor game duration and type within the framework of school–family cooperation in order to provide guidance to students.

Keywords: digital game, gaming behavior, learning responsibility, secondary school students

INTRODUCTION

Today, digital games have acquired a significant place in the lives of many people. Beyond their function of entertainment, games are also evaluated as a part of social processes such as learning, competition, and cooperation (Boyalı & Aktaş, 2023). Factors such as the acceleration of technological developments, irregular urbanization and the inadequacy of physical playgrounds for children are increasingly causing traditional forms of play to be replaced by digital games (Sağlam & Topsümer, 2019; Yazıcıoğlu-Çalışan et al., 2021). The transformation in information and communication technologies has led to digital games replacing traditional games played in open spaces (Atabay et al., 2023). The fact that digital games offer opportunities for socialization, provide a high level of interaction, and allow for enjoyable leisure time leads to their preference by wide audiences; these features stand out among the key determinants supporting the growth of the gaming market on both global and national scales (Akgöl, 2024). Indeed, according to data from the Turkish Statistical Institute (2024), playing or downloading digital games ranks third among children's internet usage purposes at 72.7%; and 90.8% of children who play digital games state that they engage in this activity regularly. Furthermore, 40.1% of children who play digital games regularly state that they play for longer than they planned, 35.6% report neglecting their responsibilities due to gaming, 29.9% spend excessive time on gaming, and 23.4% express feeling restless when they do not play digital games. These findings indicate that digital game-playing behavior is associated with difficulties in time management and the neglect of various responsibilities among children. Therefore, digital games can be considered not only as a means of entertainment but also as a potential risk factor that may be associated with students' procrastination of their academic responsibilities.

Digital games are software-based entertainment tools based on textual or visual elements that can be played online or offline on electronic platforms such as computers or game consoles (Information and Communication Technologies Authority, 2020). These games are categorized into groups such as computer, console, and mobile; notably, due to the widespread use of mobile devices and the accessibility of game applications, mobile games have become the fastest-growing category in recent years (Sanjaya et al., 2023). Digital games are structures that offer players immersive and multi-dimensional experiences by integrating narrative elements with game dynamics (Waseem, 2024). These games provide interactive and rich learning environments where players can experientially utilize skills such as planning, trial-and-error, decision-making, problem-solving, and purposeful communication (Beavis, 2022). Gee (2003) emphasizes that well-designed digital games embody fundamentally sound learning

principles and can be used in educational contexts to support learning processes. Taken together, these features suggest that digital games have the potential to support the development of various skills not only for entertainment purposes but also within educational contexts.

When integrated into teaching and learning processes, digital game-based learning environments can provide rich opportunities to support students' cognitive and affective skills. Accordingly, research indicates that digital game-based learning positively affects students' academic achievement (Chen, 2017; Kocabatmaz & Saraçoğlu, 2024; Wang et al., 2022) and attitudes (Kocabatmaz & Saraçoğlu, 2024). In an experimental study conducted at the primary school level, it was determined that digital educational games had a positive effect on number line estimation and reading proficiency; at the secondary school level, they were found to improve English vocabulary and listening skills (Tevetoğlu & Korkmaz, 2024; Vanbecelaere et al., 2020). Similarly, in a study using Newton's Race, an educational game, the game was found to significantly improve students' conceptual understanding of Newtonian mechanics (Van der Linden et al., 2024). In a subsequent study, when the game was supported by debriefing, generalization, and transfer-related lesson activities, a large and significant learning effect was reported, and transfer was fostered (Van der Linden et al., 2025). Li et al. (2024) found that digital educational games increase learning motivation and that more immersive digital environments strengthen the impact of digital educational games on learning engagement. In the study conducted by Nadeem et al. (2023), it was determined that digital game-based learning has a more positive effect on student motivation and engagement compared to traditional online activities. Bakhsh et al. (2022) stated that the digital game-based learning strategy has an innovative and attractive structure, supports critical thinking, and encourages students to focus on assignments independently. All these findings reveal that digital game-based learning provides significant contributions in both cognitive and affective domains.

While digital games provide significant benefits for learning, they may lead to various negative consequences for students when they are not designed in alignment with pedagogical principles and are used excessively or uncontrollably. Intense engagement with these games may increase the risk of digital game addiction. Indeed, it is stated that online digital games lead to addiction and negatively affect students' academic achievement, social relationships, and physical and mental health (Demuyakor, 2021). In a study comparing young adults diagnosed with internet gaming disorder with healthy individuals, it was determined that individuals in the gaming disorder group exhibited higher levels of procrastination behaviour (Yeh et al., 2017). Similarly, it has been found that the academic achievement of students who play games excessively decreases over time; furthermore, those intensively exposed to violent games display lower empathic attitudes and show more approval for aggressive behaviors (Li et al., 2012). On the other hand, it is noted that children with digital game addiction experience problems such as loss of control, neglect of social and academic responsibilities, spending excessive time on games, insomnia, and eye strain (Ersoy & Şahbaz, 2023). These findings indicate that the excessive or uncontrolled use of digital games lowers students' academic performance, increases psychological imbalances, and leads to negativities in their social relationships. These adverse effects may cause students to distance themselves from their academic obligations and weaken their responsibilities toward learning.

The relationship between digital games and students' learning responsibility should be carefully evaluated, especially when intensive and uncontrolled gaming is concerned. Learning responsibility is the conscious sense of responsibility individuals feel while taking necessary steps to complete areas where they feel deficient, fulfill tasks, and achieve goals (Yakar & Saracoğlu, 2017). This responsibility is directly related to learning behaviors that can also be carried out outside of school, such as preparation for the subject and learning, reinforcement of learned information, and fulfillment of extracurricular tasks (Brooks & Brooks, 2006, as cited in Erişti, 2017, p. 500). However, excessive focus on digital games can negatively affect this responsibility. Indeed, in a study conducted at the high school level, a moderate negative relationship was found between online game addiction and self-control; it was determined that as game addiction increased, students' self-control skills decreased (Afriwilda et al., 2020). Students' learning responsibility is also closely related to the level of development of their self-management skills. In Susanti's (2021) study, a self-management-based intervention was applied to secondary school students with low awareness of learning responsibility; at the end of the process, it was determined that self-management practices provided a significant increase in students' learning responsibility scores. Additionally, it was observed that students gained regular study habits and showed more active participation in the learning process. When these results obtained from research are evaluated in general, they indicate that digital games can be an effective variable in shaping students' learning responsibility.

A high level of learning responsibility is a critical requirement for achieving educational goals. Indeed, fostering values such as responsibility and diligence is among the objectives of various curricula (Ministry of National Education, 2018, 2023), and responsibility toward learning is considered an important outcome within this framework. However, the uncontrolled spread of digital games among children and adolescents has the potential to weaken this sense of responsibility. The literature has examined the relationship between gaming and variables such as academic achievement, learning motivation, and school adjustment, and it has been shown that increases in the level of game playing and maladaptive use have negative effects on students' academic processes (Gu et al., 2024; Lee & Jeong, 2024; Li et al., 2024). In contrast, studies examining the relationship between digital game playing attitudes and learning responsibility remain limited. This indicates a significant gap in the literature. Yet, attitudes toward digital games are considered to have substantial potential in explaining students' prioritization behaviors and their level of engagement in learning processes. Accordingly, the present study aims to address this gap by examining the relationship between digital game playing attitudes and learning responsibility. In addition, the study seeks to reveal the role of digital game attitudes on learning responsibility, thereby contributing to a better understanding of the variables affecting students' development of responsibility in educational processes and informing the design of relevant educational arrangements and interventions.

Aim of the Study

The general aim of this study is to examine secondary school students' responsibilities toward learning in terms of their digital game-playing attitudes. To find solutions to the general purpose of the research, answers to the following sub-problems were sought:

- ✓ What is the distribution of the devices most preferred by secondary school students for playing digital games (mobile phone, tablet, computer, and game console)?
- ✓ What is the distribution of students' digital game-playing attitude levels?
- ✓ Do students' digital game-playing attitudes differ significantly according to gender, duration of play, and most preferred game type?
- ✓ Is responsibility toward learning affected by the duration of digital game-playing?
- ✓ Is there a significant relationship between students' digital game-playing attitudes and their responsibilities toward learning?
- ✓ Does digital game-playing attitude significantly predict students' responsibilities toward learning?

METHODOLOGY

This study was designed within the framework of a quantitative research approach to achieve the specified research objectives. The subsequent subsections provide a detailed explanation of the adopted quantitative method.

Research Design

In this study, which examines students' learning responsibilities in terms of their digital game-playing attitudes, the quantitative research method was preferred. A correlational survey design was used in the research. This design is used to determine whether a relationship exists between two or more variables and, if so, to identify the strength and direction of that relationship (Karasar, 2013). In addition, it enables the prediction of one variable based on the values of another (Fraenkel & Wallen, 2009). In this context, the extent to which digital game-playing attitude predicts learning responsibility was also examined in the study.

Population and Sample Study

The target population of this research consists of secondary schools located in the Hüyük district of Konya province. However, since it was difficult to reach the entire population, a sampling method was adopted. The research sample was formed using the convenience sampling technique. This technique, preferred due to time and cost constraints, relies on selecting participants based on their accessibility to the researcher (Fleetwood, 2018). In the study, maximum effort was made to reflect different perspectives by reaching as many individuals as possible. The sample of the research consists of three secondary schools in the Hüyük district during the 2023–2024 academic year. The total number of male students is 135, and the total number of female students is 140. Regarding the distribution by grade level, there are 108 students in the 6th grade, 80 students in the 7th grade, and 87 students in the 8th grade. A total of 275 secondary school students participated in the research.

Data Collection Tools

Three data collection tools were utilized within the scope of the research: a Personal Information Form, the Responsibility Towards Learning Scale, and the Digital Game-Playing Attitude Scale. The Personal Information Form, prepared by the researcher, includes questions regarding students' demographic information and other research variables.

Responsibility towards learning scale

The "Responsibility Towards Learning Scale," developed by Yakar and Saracaloğlu (2017), was used to determine students' responsibilities regarding learning. The scale is unidimensional and consists of 35 items. The scale items explain 42.76% of the total variance related to the specified single factor. When the fit indices obtained from the confirmatory factor analysis were examined, the values were calculated as AGFI: .87; GFI: .92; CFI: .96; RMSEA: .062; and SRMR: .053, and these values were stated to be sufficient and significant. The reliability coefficient (Cronbach's Alpha) calculated for all items of the scale is $\alpha=.94$. For criterion-related validity, correlations with the "Sense of Responsibility and Behavior Scale" and the "Academic Self-Efficacy Scale" were examined, and it was concluded that the scale possesses criterion-related validity. There are no reverse-scored items in the scale. High scores obtained from the scale reflect a high level of responsibility towards learning. Scale scores between 35.00–62.99 indicate very low, 63.00–90.99 low, 91.00–118.99 moderate, 119.00–146.99 high, and 147.00–175.00 very high levels of learning responsibility. Sample items from the scale include "I try to support my classmates as much as I can when they are unable to complete their homework," "When a task related to the lesson is assigned in class, I volunteer to complete it," and "I feel a constant desire to participate in classroom activities." (Yakar & Saracaloğlu, 2017). As a result of the reliability analysis conducted within this study, the Cronbach's Alpha internal consistency coefficient of the scale was calculated as .89.

Digital game-playing attitude scale

The "Digital Game-Playing Attitude Scale," developed by Tekkurşun-Demir and Mutlu-Bozkurt (2019), was used to determine students' attitudes toward playing digital games. As a result of the analyses conducted by the researchers, a scale consisting of 18

items across three dimensions was obtained. These sub-dimensions are named: Cognitive (5 items), Affective (5 items), and Behavioral (8 items). Sample items from the scale include “I think digital games are a waste of time,” “I believe that digital games improve hand–eye coordination,” and “Playing digital games makes people asocial.” Confirmatory factor analysis revealed that the construct fit indices of the scale were within the acceptable range. The reliability analysis determined that the total variance explained by the scale was 65.11%. The Cronbach’s Alpha reliability coefficient was found to be .82. These values indicate that the tool is valid and reliable (Tekkurşun-Demir & Mutlu-Bozkurt, 2019).

In this study, validity and reliability analyses were re-performed on the data obtained from the applied form of the scale. Following the factor analysis conducted on the seventeen items in the application form, it was determined that the scale explained approximately 45.64% of the total variance. Additionally, as a result of the reliability analysis, the Cronbach’s Alpha internal consistency coefficient was calculated as .83. In the research, the total scores for the scale were evaluated based on three cut-off points, differing from the scoring approach used in the original scale. Accordingly, instead of the more detailed classification structure used in the original, a triple classification approach including low, medium, and high levels was preferred. This classification was created by dividing the total score range (17–85) into three equal widths. In this context, the difference between the minimum (17) and maximum (85) scores of the scale was first calculated, and this value was then divided by three to determine the interval width for each level. Based on these values, the score ranges were redefined, and total scores obtained from the scale were classified as low (17–39), moderate (40–62), and high (63–85).

Data Collection and Analysis

Before the data collection tools were administered, ethical approval was obtained through the official letter of the Afyon Kocatepe University Ethics Committee, dated 15 November 2023, and numbered 226063. In addition, official permission to conduct the study was obtained from the Konya Provincial Directorate of National Education (dated 18 December 2023; No. E-83688308-605.99-92264333). The data required for the research were collected from three secondary schools. Following the application, data obtained from a total of 275 secondary school students who completed the scales in accordance with the instructions were included in the analysis. The collected data were transferred to a computer environment and prepared for analysis.

Prior to inferential analyses, the normality of the data was examined using both descriptive statistics (mean, median, skewness, and kurtosis) and visual inspection methods (histogram, Q–Q plot, and detrended Q–Q plot). The results of the descriptive normality analysis are presented in **Table 1**.

Table 1. Normality statistics for variables and groups

Variable	Group	M	Median	Skewness	Kurtosis
Responsibility towards learning (total)	—	135.34	135.00	0.18	0.78
Digital game-playing attitude (total)	—	48.26	48.00	0.02	0.25
Digital game-playing attitude (gender)	Male	52.25	52.00	0.10	0.54
	Female	44.73	45.00	0.06	0.27
Digital game-playing attitude (game type)	Adventure	46.28	44.00	-0.16	-0.28
	Sports	47.96	47.00	0.47	1.97
	War	52.86	53.00	-0.06	0.15
	Puzzle	42.89	45.00	-0.32	-0.88
Digital game-playing attitude (gaming duration)	0–1 hour	42.59	43.00	-0.18	-0.35
	1–2 hours	49.80	48.00	0.23	-0.29
	2–3 hours	53.69	54.00	0.17	-0.42
	3–4 hours	58.57	57.00	0.74	-0.31
	4+ hours	59.31	58.00	0.36	-0.78
Responsibility towards learning (gaming duration)	0–1 hour	143.08	147.00	0.07	0.71
	1–2 hours	132.02	134.00	-0.40	-0.07
	2–3 hours	128.06	129.00	0.19	-0.09
	3–4 hours	121.68	123.50	-0.42	0.03
	4+ hours	133.07	133.50	0.85	1.10

As shown in **Table 1**, the mean and median values of the variables are closely aligned. In addition, skewness and kurtosis values were generally within the range of ± 1 , supporting the assumption of approximate normality. However, for the responsibility toward learning scores based on digital game-playing duration, the kurtosis value of the group with 4 hours or more exceeded the ± 1 threshold. Visual inspections (histogram, Q–Q plot, and detrended Q–Q plot) also revealed slight deviations from normality for this group. Therefore, the Kruskal–Wallis test was applied to analyze differences in responsibility toward learning across digital game-playing duration groups. For pairwise comparisons between groups, the Mann–Whitney U test was employed. For the other variables that met the assumption of normality, independent samples t-test, one-way analysis of variance (ANOVA), and Pearson correlation analysis were conducted (Can, 2013).

Effect sizes were calculated using different indices depending on the statistical procedure employed. Cohen’s d was used for independent samples t-tests, η^2 (eta squared) for one-way analysis of variance (ANOVA), and η^2_h for Kruskal–Wallis tests. The interpretation of effect sizes was guided by established benchmarks in the literature. Accordingly, Cohen’s d values of .20, .50, and .80 were interpreted as small, medium, and large effects, respectively (Cohen, 1988). For η^2 , values of .01, .06, and .14 were considered to represent small, medium, and large effect sizes, respectively (Şavkay, 2024).

In addition, prior to conducting regression analysis, the assumptions of simple linear regression were examined. The linearity assumption was assessed using a scatterplot showing the relationship between digital game-playing attitude and responsibility

toward learning, and a generally linear relationship between the variables was observed. The normality of residuals was evaluated using a histogram and a normal P-P plot. The histogram indicated that the residuals were approximately symmetrically distributed in a bell-shaped form, while the normal P-P plot showed that the points were largely aligned along the 45° reference line. These findings suggest that the residuals were approximately normally distributed. Homoscedasticity was assessed by examining the scatterplot of standardized residuals versus predicted values, and the residuals were found to be randomly distributed. In addition, Cook's Distance values were below 1, indicating the absence of influential outliers. The independence of errors was evaluated using the Durbin-Watson statistic ($DW = 2.043$), which indicated no autocorrelation. Taken together, these findings suggest that the assumptions of regression analysis were satisfied.

In the model established for the regression analysis, the dependent variable was determined as the responsibility toward learning score (Y), and the independent variable as the digital game-playing attitude score (X). The general structure of the model is as follows:

$$Y = \beta_0 + \beta_1 X + \epsilon$$

Accordingly, the predictive effect of students' digital game-playing attitudes on their responsibility toward learning was examined.

RESULTS

In this section, the findings obtained within the scope of the study are presented systematically in line with the research questions. First, descriptive findings regarding the devices most frequently preferred by students while playing digital games are provided. Subsequently, it is examined whether students' digital game-playing attitudes differ according to various variables. Finally, students' responsibility toward learning is analyzed in terms of digital game-playing duration, and the relationships between digital game-playing attitude and responsibility toward learning, as well as the predictive effect of this attitude, are revealed.

Findings on the Devices Preferred While Playing Digital Games

In this subsection, the findings regarding the devices most frequently used by students while playing digital games are addressed. In this context, the results of the descriptive analyses are presented in **Table 2**.

Table 2. Distribution of the most preferred devices for playing digital games

Devices	Frequency	Percentage
Phone	192	73.3
Tablet	42	16.0
Computer	18	6.9
Game Console	10	3.8

Table 2 presents the distribution of the devices most frequently used by secondary school students while playing digital games. According to the table, the most preferred device for playing digital games is the mobile phone, at 73.3%. This is followed by tablets at 16%, computers at 6.9%, and game consoles at 3.8%.

Findings on Digital Game-Playing Attitudes

After presenting the findings on the devices used for playing digital games, this subsection reports the findings regarding students' digital game-playing attitude levels. Subsequently, these attitudes were examined in terms of gender, digital game-playing duration, and the most preferred game type, respectively; the analysis results are presented in **Tables 3, 4, 5, and 6**.

Table 3 presents the distribution of students' digital game-playing attitudes. According to the table, 15.3% of the participating students have a low level, 56% have a medium level, and 28.73% have a high level of digital game-playing attitude. Considering the overall arithmetic mean (48.26), it is observed that students possess a medium-level attitude toward playing digital games.

Table 3. Distribution of students' digital game-playing attitudes

N	%	Score Range	Result	$\bar{x}$
42	%15.3	17-39	Low	48.26
154	%56	40-62	Medium	
79	%28.7	63-85	High	

Table 4 presents the t-test results regarding students' digital game-playing attitudes in terms of gender. According to the table, it is observed that the digital game-playing attitudes of males ($\bar{X} = 52.43$) are statistically significantly higher than those of females ($\bar{X} = 44.24$) ($p < 0.05$). The effect size was found to be at a moderate level (Cohen's $d = 0.75$), indicating a notable difference between male and female students in terms of digital game attitude scores.

Table 4. T-test results of digital game-playing attitude in terms of gender

Gender	N	$\bar{X}$	S	df	t	p	d
Male	135	52.43	10.78	273	6.24	.000	0.75
Female	140	44.24	10.97				

Table 5 presents the results of the one-way analysis of variance regarding attitude scores according to the time spent on digital games. In the analyses, it was observed that as the time allocated to daily gaming increased, the digital game-playing attitude

scores also increased. The ANOVA analysis showed a significant difference between the groups ($F(4, 267)=21,63, p=.000$). The effect size was calculated as $\eta^2 = .25$, indicating a large effect and showing that approximately 25% of the variance in digital game-playing attitude scores is explained by gaming duration. When looking at the differences between the groups, significant differences were found between students playing games for 0–1 hour per day and all other groups (those playing for 1–2, 2–3, 3–4, and 4+ hours per day). Similarly, significant differences were found between the group playing for 1–2 hours per day and those playing for 3–4 and 4+ hours. In these comparisons, the significant differences are in favor of those who play games more.

Table 5. ANOVA test results of digital game-playing attitude according to duration of play

Source of Variance	Sum of Squares	df	Mean Square	F	p	η^2	Significant Difference
Between Groups	8654,52	4	2163,63	21,63	.000	.25	2-1, 3-1, 4-1 5-1, 4-2, 5-2
Within Groups	26712,16	267	100,05				
Total	35366,67	271					

Table 6 presents the analysis results regarding digital game-playing attitude scores according to the most preferred game type. Significant differences were found between digital game-playing attitude scores based on the most preferred game types ($F(3, 258) = 9.59, p < .001$). The effect size was calculated as $\eta^2 = .10$, indicating a moderate effect, suggesting that approximately 10% of the variance in attitude scores is explained by the preferred game type. When examining the differences between the groups, it was observed that students who prefer war games had significantly higher attitude scores than those who prefer adventure, sports, and puzzle games.

Table 6. ANOVA test results of digital game-playing attitude according to game types

Source of Variance	Sum of Squares	df	Mean Square	F	p	η^2	Significant Difference
Between groups	3408,91	3	1136,30	9,59	.000	.10	3-1 3-2 3-4
Within groups	30564,91	258	118,47				
Total	33973,82	261					

Findings on Responsibility Toward Learning and Inter-Variable Relationships

This subsection first presents the findings regarding the distribution of students' responsibility toward learning according to digital game-playing duration. Subsequently, the results of the analyses concerning the relationship between digital game-playing attitude and learning responsibility, as well as the predictive effect of this attitude on learning responsibility, are reported, respectively. The results are presented in **Tables 7, 8, and 9**, respectively.

Table 7 presents the analysis results regarding learning responsibility according to digital game-playing duration. As a result of the analyses, it was observed that students' mean ranks of learning responsibility showed a significant difference according to their daily digital game-playing durations. The effect size was calculated as $\eta^2 = .08$ indicating a moderate effect. This suggests that approximately 8% of the variance in learning responsibility is associated with digital gaming duration. According to the data in the table, the group playing games between 0–1 hour per day has the highest learning responsibility score with 162.28, while the group playing for 3–4 hours has the lowest learning responsibility score with 90.39. In all groups except for the group playing more than 4 hours a day, it is observed that as the gaming duration increases, learning responsibilities decrease. As a result of the pairwise comparisons conducted with the Mann-Whitney U-test, a significant difference was found between the 0–1 hour group and all other groups in favor of the 0–1 hour group. A significant difference was also identified between the group playing 1–2 hours per day and the 2–3 hour and 3–4 hour groups, in favor of the 1–2 hour group.

Table 7. Kruskal-Wallis test results of learning responsibility in terms of digital gaming duration

Groups	N	Mean Rank	df	χ^2	p	η^2_h	Significant Difference
1) 0-1 Hours	115	162.28	4	25.824	.000	.08	1-2, 1-3, 1-4 2-3, 2-4 5-3, 5-4
2) 1-2 Hours	88	126.86					
3) 2-3 Hours	33	108.27					
4) 3-4 Hours	22	90.39					
5) 4+ Hours	14	124.32					
Total	272						

Table 8 presents the results of the Pearson correlation analysis regarding the relationship between digital game-playing attitude scores and learning responsibility scores. As a result of the analysis, a low-level, negative, and significant relationship was identified between digital game-playing attitude and responsibility toward learning ($r=-0.205, p<0.01$). According to this result, as the digital game-playing attitude increases, a decrease in students' responsibilities toward learning is observed.

Table 8. The relationship between digital game-playing attitude and learning responsibility

Variables	N	Digital Game-Playing Attitude	Responsibility Towards Learning
Digital Game-Playing Attitude	275	1	-0.205*
Responsibility Towards Learning	275	-0.205*	1

* $P < 0.01$

Table 9 presents the results of the simple regression analysis. In the established model, digital game-playing attitude was included in the analysis as the independent variable, and learning responsibility as the dependent variable. According to the analysis results, digital game-playing attitude significantly predicts learning responsibility scores [$B=-0.42, SE=0.12, t=-3.46, p<.001$]. According to the model, every one-unit increase in the digital game-playing attitude score decreases the learning responsibility score by 0.42 points.

Table 9. Regression results regarding digital game-playing attitude as a predictor of learning responsibility

Variables	B	SE	t	p	95% CI	
					LL	UL
Constant	155.73	6.06	25.68	0.0	143.79	167.67
Digital Game Playing Attitude	-0.42	0.12	-3.46	0.001	-0.66	-0.18

Note. B = regression coefficient; SE = standard error; CI = confidence interval; LL = lower limit; UL = upper limit; $p < .001$ is considered significant.

DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

In this study, which examines students' learning responsibilities in terms of their digital game-playing attitudes, several significant findings were obtained. According to descriptive analyses, among mobile phones, tablets, computers, and game consoles, the most preferred device for students to play games was the mobile phone at a rate of 73.3%. The least preferred device was game consoles at 3.8%. This finding can be interpreted as an indicator that mobile phones are more effective in shaping students' gaming behaviors (playing duration, game preference, etc.) compared to other devices. The study by Atabay et al. (2023) also supports this finding, revealing that students who play digital games most frequently prefer smartphones. According to data from the Turkish Statistical Institute (2024), playing digital games ranks fifth at a rate of 72.5% among the usage purposes of children aged 6–15 who regularly use mobile phones/smartphones. It is thought that the easy accessibility of mobile phones, the prevalence of mobile games, and the relatively more difficult nature of parental supervision make mobile phones more attractive to students.

When examining students' digital game-playing attitudes, it was observed that 15.3% possess a low level of attitude, while the vast majority exhibit medium or high levels. Looking at the overall mean, it is understood that students have a moderate level of digital game-playing attitude. This finding indicates that digital games receive widespread interest among students. Previous research has revealed that both students' attitudes toward digital games and their motivations for playing these games are at a moderate level (Mutlu-Bozkurt et al., 2019; Yıldırım & Şimşek, 2022). Conversely, in the study conducted by Erdoğan and Yıldırım (2023), it was determined that students' digital game-playing attitude levels were high. The results of this research show that the majority of students have a medium or high level of digital game-playing attitude. This situation necessitates a careful consideration of both educational opportunities and patterns of use that require balance. Indeed, the literature states that while digital games increase students' learning motivation (Chen, 2017), they are also associated with loss of control, neglect of responsibilities, and various health problems in cases of addiction (Ersoy & Şahbaz, 2023).

Another finding obtained from the research indicates that male students have higher digital game-playing attitudes compared to females. This finding demonstrates that male students are more interested, willing, and possess higher attitudes toward digital games than female students. In their study conducted with primary and secondary school students, Yazıcıoğlu-Çalışan et al. (2021) found significant differences in favor of males in all sub-dimensions (cognitive, affective, and behavioral) of digital game-playing attitude. Similarly, while Erdoğan and Yıldırım (2023) stated that male students' digital game-playing attitude levels were higher than those of female students, Özgen (2024) revealed that male students had higher levels of both attitude and digital game addiction. The meta-analysis study by Liu et al. (2024) also supports this situation, showing that males' attitudes toward digital game use are more positive. Studies regarding digital game-playing motivation have also determined that male students scored significantly higher in the "achievement and revival" and "curiosity and social acceptance" sub-dimensions compared to female students (Tekkurşun-Demir & Cicioğlu, 2019; Yıldırım & Şimşek, 2022). This finding indicates that the interests and orientations underlying the gaming behaviors of girls and boys are different. When the research findings are evaluated overall, it can be said that males have higher levels of attitude and motivation toward digital games. It is thought that this gender-based difference is also reflected in game preferences and usage habits.

Another significant finding obtained from the research reveals a significant relationship between digital game-playing duration and digital game-playing attitudes. Generally, it has been observed that as daily gaming duration increases, attitude scores toward digital games also rise. The existence of significant differences, particularly between students playing for 0–1 hour per day and groups playing for longer durations, indicates that students who allocate more time to digital games possess higher attitudes toward them. Similarly, the study by Namlı and Tekkurşun-Demir (2020) determined that digital game-playing duration creates significant differences in digital game attitude. Mutlu-Bozkurt et al. (2019) reported significant differences across all sub-dimensions of the digital game-playing attitude scale, noting that attitude scores increased as gaming duration rose. Özgen (2024) found that increases in daily digital gaming duration were associated with higher digital game-playing attitude scores and game addiction scores. All these findings support the results of the present study, indicating that students' attitudes toward digital games differ significantly according to gaming duration, with generally higher attitudes observed among students who spend more time playing digital games. Furthermore, it should not be overlooked that increased digital game-playing duration may be associated with a higher risk of addiction. Indeed, Polat and Topal (2022) found that male students with high weekly gaming frequency have a high risk of digital game addiction, and this addiction negatively affects academic achievement. This finding is consistent with the study by Szyszka et al. (2025), in which researchers revealed that gaming duration shows a significant relationship with gaming disorder. Focusing on the academic implications of this phenomenon, Cho et al. (2024) determined that as students' levels of internet gaming disorder increased, their learning performance decreased significantly. When the findings of this study are considered together with the existing literature, it is observed that there is a significant relationship between gaming duration and digital game-playing attitudes. In addition, the literature reports that gaming duration is associated with the risk of addiction, and this situation is understood to be negatively related to academic achievement. Accordingly, it is recommended that students' daily gaming time be regulated within certain limits through school-family collaboration, that

awareness-raising educational activities on digital game use be provided, and that students be guided toward educational digital games.

Research findings reveal that students' game-playing attitudes differ significantly according to the types of digital games they prefer. In particular, it was observed that students who prefer war-type games have higher attitudes toward digital games compared to those who prefer sports, puzzle, and adventure-themed games. This situation can be attributed to the fact that war games generate more excitement and engagement among students due to elements such as competition, task completion, strategy development, and earning rewards. In a study, it was determined that children most frequently prefer war and action-based digital games such as PUBG, Minecraft, League of Legends, GTA 5, Valorant, Roblox, and Brawl Stars. The same research shows that features such as tactical development, task completion, fighting enemies, and survival stand out in the games preferred by these children (Tozduman Yaralı, 2025). Another study conducted in Malaysia stated that MOBA (Multiplayer Online Battle Arena), a type of online multiplayer game, is the most commonly preferred digital game genre among secondary school students (Wan Ahmad et al., 2022). Due to the intensity of violence and excitement elements, such competitive games increase players' interest and can strengthen their attitudes toward digital games. This situation also brings the risk of game addiction. While André et al. (2024) emphasize that individuals who prefer competitive game genres experience gaming disorder symptoms more intensely, Aleksić (2018) also states that there is a significant relationship between digital game-playing and gaming disorder. In this regard, it is recommended that educators and parents focus on both the duration of play and the types of games played, maintaining a supervisory attitude toward the risks posed by violence-based content. Additionally, guidance should be provided in directing students toward digital games with appropriate content, considering cognitive, affective, and behavioral effects when choosing game types.

The research reveals that daily digital game-playing duration significantly differentiates learning responsibility. Students who play games within the 0–1 hour interval per day possess higher levels of responsibility compared to all other groups. Similarly, it was observed that students with a 1–2 hour gaming duration have higher responsibility than those in the 2–3 and 3–4 hour groups. In all groups except for the group playing more than 4 hours per day, it was observed that as gaming duration increases, the mean ranks for responsibility toward learning decrease. Overall, the increase in daily gaming duration negatively affects students' learning responsibility. This situation is an indicator that students who play digital games more frequently focus less on their academic tasks and learning-related responsibilities. Previous research has demonstrated that the academic achievement of students who play games excessively decreases over time, and various problems such as neglect of time management and academic responsibilities are observed in these individuals (Ersoy & Şahbaz, 2023; Li et al., 2012). On the other hand, the study found that the group with the longest gaming duration (4+ hours) had higher mean ranks for responsibility than the groups with 2–3 and 3–4 hours of gaming duration. This indicates that the relationship between gaming duration and learning responsibility does not always follow a linear path. A possible reason for this might be related to the game preferences of the students in that specific group. Indeed, some games in digital environments have educational content and possess the potential to increase students' study motivation. Therefore, it is recommended that researchers who wish to conduct studies in this field include the classification of game content alongside gaming duration in their research.

Another significant finding of the research reveals a negative and significant relationship between digital game-playing attitude and responsibility toward learning. According to the regression analysis results, a one-unit increase in digital game-playing attitude predicts an approximately 0.42-point decrease in learning responsibility scores. This finding indicates that higher levels of digital game-playing attitude are associated with lower levels of learning responsibility. This situation may be related to the fact that, as students' interest in digital games increases, they tend to allocate more of their time and attention to these activities, which may in turn be associated with a relative decrease in the time and focus they devote to academic tasks. In particular, the structure of some digital games, which requires a high level of attention and interaction and carries the potential to be addictive, may create a competitive context that makes it more difficult for students to engage in academic activities. In this context, higher levels of digital game-playing attitudes may be associated with lower prioritization of learning responsibilities. There are studies in the relevant literature that support this finding. Kaya et al. (2024) and Soylu and Çelik (2025) revealed significant decreases in children's responsibility scores as their level of digital game addiction increased. Similarly, Eskili and İflazoğlu Saban (2025) stated a moderate, negative relationship between students' digital game addiction and their learning and study responsibilities, reporting that digital game addiction explained 19.8% of the responsibility scores. Zamari et al. (2024) express that students procrastinate on their academic responsibilities due to excessive focus on digital games, their attention shifts from lessons to the world of games, and this reduces their interest in learning. When the findings of this study are considered together with the existing literature, it can be suggested that higher levels of digital game-playing attitudes and higher levels of digital game addiction are consistently associated with lower levels of responsibility. This general pattern may point to differences in how students allocate their time, attention, and priorities. Accordingly, it is recommended to strengthen practices aimed at developing students' self-regulation and time management skills in order to support their ability to manage digital game use more consciously and in a balanced manner. In addition, integrating educational digital games that support academic responsibility into learning processes is also recommended.

This study contributes to the literature by providing empirical evidence on the relationship between secondary school students' digital game-playing attitudes and their responsibility toward learning. The findings indicate that higher levels of digital game-playing attitudes and generally longer gaming duration are associated with lower levels of academic responsibility. In particular, certain game types, such as competitive and violence-themed games, may be associated with higher levels of engagement and, in some cases, problematic gaming behaviors. These patterns may be linked to increased interest in digital games and a relative decrease in students' attention to learning activities and responsibilities. This situation can subsequently lead to low academic achievement. Indeed, Anjum et al. (2024) found that students with lower addiction levels showed higher academic achievement. In a systematic review conducted by Alzahrani and Griffiths (2025), a negative relationship was identified

in 24 out of 27 studies examining the relationship between problematic gaming and academic success. In this context, considering both the educational potential and risky aspects of digital games, it is recommended to develop awareness-raising program content for game literacy within the scope of system literacy. Furthermore, it is suggested that teachers and families should be made more conscious of the effects of game types and gaming duration on academic responsibilities and should assume a guiding and supervisory role in directing children.

In addition to the recommendations discussed earlier, and based on the findings of this study, several further practical and research-oriented recommendations can be proposed. First, considering that increased digital game-playing attitudes and longer gaming durations are associated with lower levels of responsibility toward learning, it is recommended that students' gaming habits be monitored and regulated collaboratively by teachers and parents. In this context, raising awareness through school-based programs and family education initiatives may help students use digital games in a more balanced and responsible manner, thereby strengthening their sense of learning responsibility.

Second, rather than completely restricting digital game use, it is important to guide students toward educational and developmentally appropriate digital games. The literature emphasizes that digitally supported instructional practices contribute to students' cognitive and affective development (Aldalalah et al., 2025; Alkouri & Wardat, 2025; Mansour & Wardat, 2025). In this regard, integrating well-designed digital game-based learning environments into instructional processes may help harness the educational potential of digital tools while also enhancing students' motivation.

Third, given that students' attitudes differ significantly according to gaming duration and game type, it is recommended that teachers and school administrators take these variables into account when designing learning environments. In particular, considering that students who prefer war-themed games exhibit significantly higher levels of digital game-playing attitudes compared to other groups, targeted guidance and monitoring strategies should be developed for these students. For example, teachers can incorporate structured discussions on game content, promote critical awareness regarding the potential effects of intensive gaming, and guide students toward more educational and developmentally appropriate digital games. In addition, setting reasonable limits on gaming duration and providing alternative engaging learning activities may help students balance their gaming habits with their academic responsibilities.

Finally, future research should address digital game use within a broader framework by employing longitudinal designs and mixed-method approaches. Such studies would provide deeper insights into how gaming behaviors evolve over time and how they interact with students' academic and psychological development.

In addition to these recommendations, the findings of this study should be interpreted in light of several limitations. First, the study was conducted using a convenience sample drawn from three secondary schools within a single district, which may limit the generalizability of the findings. Second, due to the cross-sectional and correlational nature of the research design, causal inferences cannot be established. In addition, the reliance on self-report measures may have introduced response bias and social desirability effects. Another important limitation is that the data were collected at a single point in time; therefore, future studies employing longitudinal designs are recommended to better capture changes in students' gaming behaviors and learning responsibilities over time. Furthermore, as the present study was based solely on quantitative data, it may not fully reflect the complexity of students' experiences. In this regard, future research utilizing mixed-method approaches could provide a more comprehensive and in-depth understanding of the relationship between digital game-playing attitudes and learning responsibility.

Funding: No funding source is reported for this study.

Acknowledgements: The author would like to thank Ibrahim Sever for his contributions to the data collection process.

Ethical statement: The author stated that the study was approved by the Afyon Kocatepe University Ethics Committee (Approval Code: 226063; Approval Date: 15 November 2023). Written informed consents were obtained from the participants.

AI statement: The author stated that artificial intelligence-based tools were used to a limited extent to support the literature review and to improve the linguistic fluency of the manuscript.

Declaration of interest: No conflict of interest is declared by the author.

Data sharing statement: Data supporting the findings and conclusions are available upon request from the author.

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