

The relationship between digital game addiction, reading motivation and students' comprehension levels*

Şafak KAMAN¹ Aydın BULUT²

To cite this article:

Kaman, Ş., & Bulut, A. (2025). The relationship between digital game addiction, reading motivation and students' comprehension levels. *e-Kafkas Journal of Educational Research*, 12, 362-380. doi:10.30900/kafkasegt.1538393

Research article

Received:25.08.2024

Accepted:16.04.2025

Abstract

In This research aimed to determine the relationship between digital game addiction, reading comprehension, and reading motivation among fourth-grade elementary school students. The study aims to identify the extent to which the level of digital game addiction in children affects their reading skills. The research was designed as a correlational scanning study. The sample group of the study consisted of 374 fourth-grade students attending schools in the Pursaklar district of Ankara during the 2023-2024 academic year. The data collection instruments used were the Digital Game Addiction Scale, Reading Comprehension Test, and Reading Motivation Scale. SPSS package program was used for data analysis, and Pearson Moment Correlation Coefficient, t-test, mean, and percentage were used in the analysis of the findings. It was found that there is a moderately negative relationship between digital game addiction and reading motivation, a moderately significant negative relationship between digital game addiction and reading comprehension, and a moderately significant positive relationship between reading motivation and reading comprehension. Additionally, it was concluded that the digital game addiction of male students is higher than that of female students; however, female students have higher levels of reading motivation and reading comprehension compared to male students. The research findings indicate that as digital game addiction increases, students' motivation to read and their reading comprehension skills decrease. It was observed that the addiction of children to games they enjoy playing negatively affects their reading skills.

Keywords: Digital game addiction, reading motivation, reading comprehension.

* This study was presented as an oral presentation at the 10th International Congress of Scientific Researches of the Black Sea Countries in 2024.

¹  Corresponding Author, safakkaman@gmail.com, Kastamonu University Faculty of Education, Kastamonu, Türkiye.

²  Author, Kastamonu University Faculty of Education, Kastamonu, Türkiye.

Introduction

Reading is a fundamental skill that holds an important place in individuals' lives. This process, which can be carried out for various purposes, stands out as an essential tool for acquiring knowledge, personal development, and entertainment (Arslan & Polat, 2025). The impact of reading on both individual and social life can be evaluated from many perspectives. First and foremost, reading plays a determining role in individuals' academic and professional success. Having a strong reading habit is of great importance for succeeding in education, developing social skills, obtaining a good job, and advancing in one's career. Research shows that early literacy skills, which are acquired at a young age, develop in line with a child's social environment and the stimuli they are exposed to, laying a solid foundation for future academic achievements (Uyanık & Kandır, 2010). Reading also directly contributes to an individual's cognitive development. Children who develop the habit of reading from an early age not only improve their language skills but also strengthen their listening and comprehension abilities (Justice & Kaderavek, 2004). Additionally, reading supports creativity and critical thinking skills. According to Akyol (2005), an effective reading process should be built on five essential elements: Reading should be based on meaning-making, fluency should be developed, it should be approached strategically, it should be lifelong, and the individual's reading motivation should be high. Developing fluent reading skills is one of the fundamental elements that strengthen an individual's reading habit. Güneş (2007) states that various methods, such as echo reading, repeated reading, paired reading, shared reading, reader's theaters, and choral reading, can be used to support the development of fluent reading.

Reading is a skill that supports not only an individual's cognitive development but also their social aspect (Türkben & Gündeğer, 2021). Therefore, students are expected to acquire reading skills and use them in every area of their lives. When definitions of reading are examined, the concept of comprehension is emphasized. Just and Carpenter (1980) define reading as a process of seeing, perceiving, and making sense of the text as a whole. Other researchers have also emphasized that reading is the process of making meaning and that the reader needs to extract meaning from written forms (Harris & Sipay, 1990; Demirel, 1999). Akyol (2021), in discussing the active and effective communication between the reader and the writer in the reading process, highlights that the process of meaning-making is dynamic. These definitions suggest that seeing, perceiving, cognitive processes, and structuring must work together, and that meaning-making should occur at the end of the reading process.

One of the main purposes of reading is to improve students' comprehension skills. Reading comprehension, which is the process of extracting meaning from written texts, is a fundamental language skill that students need to develop in the early stages of their education (Rose et al., 2000). Reading comprehension can be defined as the process in which the reader interacts with the content of the text by integrating their prior knowledge and experiences with the text's content and relationships (Pardo, 2004). The primary goal of reading, reading comprehension, is described as a complex process that requires active, conscious, and cognitive effort (Kent, 2002). This process occurs through conscious thinking that connects thinking processes, the content of the text, and the reader's prior knowledge, expectations, and reading goals. Therefore, the goal of reading comprehension is to structure and construct the reader's cognitive development (Block, 2004). Reading comprehension is a critical skill for academic success at all levels of the education system (Clinton-Lisell et al., 2022; Meneghetti et al., 2006). Reading comprehension is a complex process involving the interaction of various cognitive processes (Oakhill & Cain, 2000; Swanson et al., 2007; Van den Broek & Espin, 2012). Various mental activities, such as using prior knowledge, note-taking, making predictions, summarizing, establishing relationships between paragraphs, and identifying main ideas, are performed in the reading comprehension process. Acquiring reading comprehension skills is a critical step in eliminating many obstacles that students may encounter in their learning process. It is evident that students who struggle with reading comprehension are unable to grasp the information presented in the text. This issue is commonly observed in the exams in our country. As a result, developing students' reading comprehension skills emerges as a fundamental necessity.

The process of extracting meaning from a text is a complex process with many components (National Reading Panel, 2000). Since the primary purpose of reading is to extract meaning from a text, factors

that influence this process become significant. Motivation for reading is one of these factors. Reading motivation is a key structure that affects the time an individual devotes to reading, their tendency to read, and the effort they put into the reading process. This structure is built on the individual's interest and curiosity about reading (Yıldız & Aktaş, 2015). The decision to read directs the individual to reading. Without the decision to read, the individual will not feel compelled to read (Ürün Karahan & Taşdan, 2016). The importance of reading motivation is clearly observable in the reading process (Akyol, 2005; Baker & Wigfield, 1999).

Motivation not only affects students' learning preferences but also has a significant impact on their academic success (Türkben & Gündeğer, 2021). In order to increase students' reading motivation, educators, families, and environmental factors must come together to provide students with engaging materials, support their reading skills, and create a positive reading culture. This way, students' relationship with reading will strengthen, and their motivation will increase. Reading is an important factor that affects students' personal, academic, and social development. The benefits provided by reading are directly related to students' interest in reading and their reading comprehension skills. Motivations that guide students to read highlight the concept of reading motivation (Yıldız & Akyol, 2011). Reading motivation is defined as the individual's personal values, beliefs, and goals related to reading (Guthrie & Wigfield, 1999). This concept also includes the individual's negative values, goals, and beliefs about reading activities, processes, and topics. Determining the force that triggers reading activities, ensures that the individual feels successful in their education, and engages them in the reading process is of great importance (Güneş, 2007). Reading motivation is defined as the energy required for the formation of interest, attitude, curiosity, and action towards reading, for realizing the importance of reading, and for maintaining the reading habit (Katrancı, 2015). Reading plays a key role in individuals' cognitive development, vocabulary enrichment, and overall learning processes. However, it is observed that many students' reading motivation decreases over time. In this context, specific factors affecting students' reading motivation become crucial.

Today, digital games that children can easily access are one of the most significant factors affecting reading motivation. Digital games, played either alone or with others over the internet via computers or similar devices, have become an important part of children's entertainment activities (Şimşek & Yılmaz, 2020). Digital games are among the activities where children spend a large portion of their time, and although these games support cognitive skills such as attention, speed, strategy development, and problem-solving, they can negatively affect reading habits. As children spend more time on digital games, their interest in books or written materials decreases. This situation can lead to a decrease in reading motivation and, in the long term, regressions in the development of reading skills.

The addictive nature of digital games can lead to the development of digital game addiction, which can exacerbate this problem. Digital game addiction is defined as a behavioral addiction in which the individual cannot control the desire to play digital games, experiences emotional, cognitive, and behavioral changes, and shows various disruptions in daily life due to excessive gaming (Mustafaoğlu & Yasacı, 2018). Such addictions may further reduce children's reading motivation and hinder their cognitive development.

While research (Fiorentini & Berardi, 1980; Green & Bavelier, 2014; Karni & Sagi, 1991) has shown that digital games positively support children's cognitive functions, hand-eye coordination, strategy development skills, quick decision-making processes, and quick-thinking abilities, researchers (Aslan et al., 2022) have also identified numerous problems arising with the transition of digital game playing habit into addiction. Karabulut (2019) in his study on high school students, examined the impact of different variables on digital game addiction and tendency towards violence, finding that male students had higher levels of digital game addiction and tendency towards violence compared to female students, and there was a significant positive relationship between digital game addiction and tendency towards violence. Tuncay and Göger (2022) investigated the relationship between digital game addiction and sleep quality among adolescents in their study, finding a positive relationship between digital game addiction and sleep quality. Mutlu Bozkurt (2022) examined the relationship between students' educational level and digital game addiction through certain variables. According to the findings, students with lower academic achievement levels had higher levels of digital game addiction. Moreover, when the studies in the literature on digital games are categorised, these studies are

generally related to self-efficacy (Chen & Tu, 2021; Deng et al., 2020; DeSmet et al., 2018; Santos Chagas et al., 2020; Mukund et al., 2022; Wang & Zheng, 2021), pedagogy (Chen & Lin, 2016; Kaimara et al., 2021; Lee & Zhu, 2022), educational gaming (Hebert et al., 2021), learning motivation (Chen & Wu, 2023; Deng et al., 2020; Pill et al., 2019; Salgarayeva et al., 2021), collaborative learning (Chen et al., 2022; Chen & Chuang, 2021; Fu et al., 2022; Yamazaki, 2018; Yang et al., 2023), game-based learning (Chen, 2023; Dai et al., 2022; Junttila et al., 2022; Yang and Kuo, 2022; Zhang, 2022), motivation (Hoyng, 2022; Sarkar & Sarkar, 2022; Yeo et al., 2022), engagement (Goli et al., 2022; Liu et al., 2022; Mahat et al., 2023; Tay et al., 2022; Teng et al., 2022), digital game-based learning (Dai et al., 2022; Froland et al., 2022; Korand et al., 2022; Pan et al., 2022), teaching (Bardelli et al., 2022; Wang et al., 2022; Yeo et al., 2022), early childhood (Homer et al., 2019; Huh, 2017; Mattsson & Laike, 2022; Raynal et al., 2022; Smith et al., 2020; Tang, 2021; Thai et al., 2022; Veraksa et al., 2022; Veresov & Veraksa, 2023), narrative (Dai et al., 2022; Hu et al., 2022), game addiction (Cankurtaran et al., 2022; Tuncay & Goger, 2022).

In research related to digital game addiction, it has been observed that reading motivation and comprehension skills are not addressed. This situation reveals a gap in understanding how the increasing popularity of digital games affects students' interest in written materials, despite the growing popularity of these games. The effects of digital game addiction on young people's critical thinking and deep understanding levels have not been sufficiently examined. The fast-paced events in games and constantly changing scenarios necessitate further research on how these may affect young people's abilities to understand and interpret written texts. In this context, the study aims to address a gap in the field by exploring the relationship between digital game addiction, reading motivation, and comprehension levels. To achieve this, the following research questions were posed.

1. Is there a significant relationship between the scores of digital game addiction scale and the scores of reading motivation scale of 4th grade elementary students?
2. Is there a significant relationship between the scores of digital game addiction scale and the comprehension scores of 4th grade elementary students?
3. Is there a significant relationship between the reading motivation scale scores and the comprehension scores of 4th grade elementary students?
4. Do the digital game addiction scale scores, reading motivation scale scores, and comprehension scores of 4th grade elementary students vary by gender?

Method

This section includes information about the research model, study group, process, data collection and data analysis.

Research Design

The study employed a relational survey model, which aims to identify the degree and nature of the relationship between two or more variables. This approach is used to determine if and how variables co-vary. The analysis within this model focuses on whether the variables change together and, if so, the nature of this change (Büyüköztürk, 2014; Karasar, 2020). This study aimed to explore the relationship between students' reading comprehension, digital game addiction, and reading motivation. To achieve this, the relational survey model was deemed the appropriate method.

Sample Group

The research sample comprised 4th grade elementary students enrolled during the 2023-2024 academic year in schools located in the Pursaklar district of Ankara province. A total of 374 students from four elementary schools affiliated with the Ministry of National Education in Pursaklar district formed the research sample. Table 1 provides detailed information about the sample group.

Table 1.
Descriptive Data For The Sample Group

Grade Level	Female		Male		Total	
	n	%	N	%	N	%
4 th Grade	179	47.8	195	52.2	374	100

When examining the data in Table 1, it is found that 47.8% of the sample group consists of female students, while 52.2% consists of male students. In total, 374 elementary school students have participated in the study.

Data Collection Instruments

Digital Game Addiction Scale: For data collection, we utilized the "Digital Game Addiction Scale (DGAS) for Children," developed by Hazar and Hazar (2017). The results from the confirmatory factor analysis indicated the following fit index values: X^2/df : 1.48, RMSEA: 0.05, PGFI: 0.68, PNFI: 0.77, GFI: 0.85, AGFI: 0.87, IFI: 0.95, NFI: 0.91, CFI: 0.95. To assess the reliability of the measurement tool, we evaluated internal consistency (Cronbach's Alpha) and Test-Retest correlation coefficients. The Test-Retest correlation coefficient was .81 for the overall scale, .82 for the first sub-factor, .88 for the second sub-factor, .73 for the third sub-factor, and .70 for the fourth sub-factor. These reliability findings demonstrate that the scale is a reliable measurement instrument.

Reading Motivation Scale: To assess students' reading motivation levels, the Reading Motivationn (RM) scale, comprising 18 items and adapted to Turkish by Yıldız (2013), was employed. This scale delineates two dimensions: reader self-perception and the significance attributed to reading, alongside overall reading motivation. Yıldız (2013) conducted validity and reliability studies for the RMP scale, yielding a Cronbach's Alpha internal consistency coefficient of .81. Ataş (2015) also computed this coefficient, obtaining .66 for reader self-perception, .62 for the value ascribed to reading, and .73 for general reading motivation. These findings led to the conclusion that recalculating the reliability coefficient for the RMP scale was unnecessary, given its satisfactory quality. Yıldız (2013) further examined validity using confirmatory factor analysis (CFA), resulting in acceptable chi-square values ($X^2 = 229.09$, $df = 134$, $X^2/df = 1.70$), affirming the scale's validity and reliability for measurement purposes.

Reading Comprehension Test: In assessing students' reading comprehension levels for the study, we utilized the Reading Comprehension Test crafted by Bulut (2021). Following a pilot study of the test, we calculated difficulty and discriminative indices for each item. Based on these indices, we selected 20 suitable questions to include in the reading comprehension test.

Table 2.
Psychometric Properties of Reading Comprehension Items

Text type	Item number	D	P	α
Narrative text	Question 1	.34	.36	.72
	Question 2	.34	.44	
	Question 3	.34	.44	
	Question 4	.41	.71	
	Question 5	.42	.51	
	Question 6	.36	.63	
	Question 7	.53	.76	
	Question 8	.34	.40	
	Question 9	.38	.50	
	Question 10	.26	.57	

Table 2 continuing

Informative text	Question 1	.33	.41	.79
	Question 2	.33	.37	
	Question 3	.33	.56	
	Question 4	.25	.54	
	Question 5	.33	.50	
	Question 6	.37	.56	
	Question 7	.37	.39	
	Question 8	.41	.51	
	Question 9	.37	.60	
	Question 10	.33	.62	

Table 2 shows the item difficulties, item discriminant indices, and reliability coefficients of the test items. When the discriminant indices of the items in the test were examined, it was observed that the values were higher than 0.20 for all items. To determine the measurement reliability of the reading comprehension test, the Cronbach Alpha internal consistency coefficient method was utilized. As a result of the analyses, the Cronbach Alpha coefficient for the test related to the narrative text was calculated as 0.72, and for the informative text, it was calculated as 0.79. When the Cronbach's alpha values of the tests are above .70, it shows that the measurements are reliable for both tests (Büyükoztürk, 2014; Meyer et al., 2013).

Data Collection Process

The data of this study, which examines the relationship between digital game addiction, reading comprehension and reading motivation in primary school fourth grade students, consisted of 374 fourth grade students attending schools in Pursaklar district of Ankara in the 2023-2024 academic year. The research data were collected by the researchers. During the data collection process, students were interviewed face-to-face and the application was carried out on a voluntary basis. Before the scale application, students were asked preparatory questions about the application format of the scale.

Data Analysis

In the analysis of the research data, SPSS 22 software package was used. Initially, to determine whether the data exhibited a normal distribution, the skewness and kurtosis values of the obtained data were examined. Skewness and kurtosis coefficient values being between -1 and +1 indicate that the scores are normally distributed.

Table 3.

Normality Test Data For Students' Digital Game Addiction Scale Scores and Reading Attitude Scale Scores

Values	N	Min	Max	Mean	Sd	Skewness	Kurtosis
DGAS	374	1	5	2.17	.88	.35	.13
RM	374	1	4	2.83	.58	-.61	-.56

When examining Table 3, it is observed that the skewness and kurtosis coefficient values for the digital game addiction scale scores are between -1 and +1. It is understood that the kurtosis and skewness values for the reading motivation scale scores are also between -1 and +1. The analysis results reveal that the students' scores for the digital game addiction scale and the reading motivation scale are normally distributed (George & Mallery, 2010). Therefore, an independent samples t-test has been applied in the analysis of the data to determine the relationship between gender variables. The Pearson Product-Moment Correlation has been used to elucidate the relationship between students' digital game addiction, their reading motivations, and their reading comprehension. In addition, frequency, percentage, and mean scores have been utilized for the description of the data.

Findings

In this part of the study, the findings obtained as a result of the research are presented in tables. The interpretation and evaluation of the findings are mentioned in the discussion section. The first sub-objective of the research is to examine the relationship between the Digital Game Addiction Scale

scores of 4th grade primary school students and their Reading Motivation scores. The findings related to this analysis are presented in the table below.

Table 4.

Correlation Between Digital Game Addiction and Reading Motivation

Variable	N	r	p
Digital game addiction	374	-.695	.00
Reading motivation			

$p < .01$

The data presented in the table indicate a statistically significant moderate negative correlation between digital game addiction scores and reading motivation scores among 4th-grade elementary students ($r = -.695$; $p < 0.01$). This suggests an inverse relationship between digital game addiction and reading motivation, whereby an increase in one is associated with a decrease in the other. Additionally, the second sub-objective of the research involved examining the correlation between digital game addiction scores and reading comprehension scores among 4th-grade students. The findings from this analysis are presented in the table below.

Table 5.

The Correlation Between Reading Comprehension and Reading Motivation Scores

Variable	N	r	p
Digital game addiction	374	-.655	.00
Reading comprehension			

$p < .01$

Based on the data provided in the table, it has been established that there exists a statistically significant moderate negative correlation between the scores on the digital game addiction scale and the reading comprehension scores of 4th-grade elementary school students ($r = -.655$; $p < .01$). This finding highlights a negative relationship between digital game addiction and reading comprehension abilities among 4th-grade elementary students. To elaborate, as students' engagement in digital games increases, their proficiency in reading comprehension tends to decrease, and conversely, as digital game addiction decreases, reading comprehension abilities improve. Furthermore, as part of the research's third sub-objective, the correlation between the scores on the digital game addiction scale and reading comprehension scores of 4th-grade elementary school students was investigated, with the findings being presented in detail in the table below.

Table 6.

The Correlation Between Reading Comprehension and Reading Motivation Scores

Variable	N	r	p
Reading comprehension	374	.506	.00
Reading motivation			

$p < .05$

Based on the information provided in the table, it has been established that there exists a statistically significant moderate positive correlation between the reading comprehension scores and reading motivation scores of 4th-grade elementary school students ($r = .506$; $p < .01$). This discovery signifies a direct association between reading motivation and reading comprehension levels among 4th-grade elementary school students. Put simply, as students' reading motivation elevates, their reading comprehension proficiency also tends to rise; conversely, when reading motivation diminishes, so does the level of reading comprehension.

Figure 1 provides a graphical representation of the findings, illustrating several key correlations: a moderate negative relationship between digital game addiction and both reading comprehension and reading motivation, and a moderate positive correlation between reading motivation and reading comprehension. Additionally, as part of the fourth sub-goal of the study, potential gender differences in scores on the digital game addiction scale, reading motivation scale, and reading comprehension

among 4th-grade elementary students were examined. Detailed results are presented in the following tables.

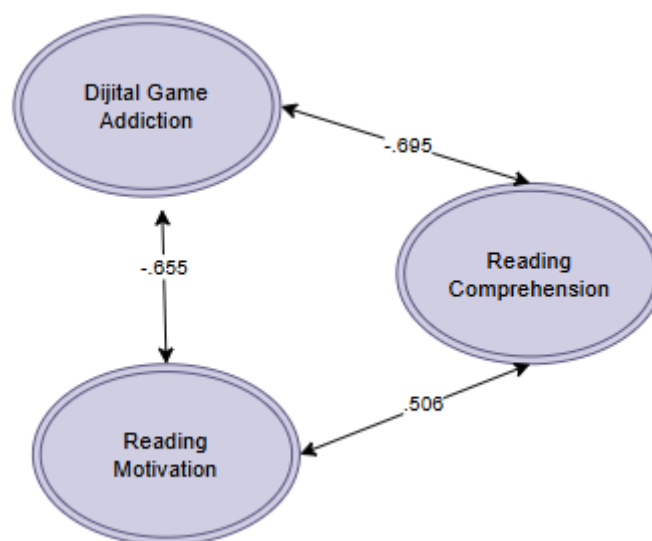


Figure1. The relationship between variables.

Table 7.
t-test Results For Digital Game Addiction Scale Scores By Gender

Gender	N	M	SD	df	t	p
Male	171	2.53	1.01	372	8.100	.00
Female	153	1.84	.59			
Total	324	2.8	.80			

$p < .01$

According to the data presented in the table, there was a statistically significant difference in digital game addiction scores between male and female 4th-grade elementary school students, $t_{(372)} = 8.10$, $p < .01$. Male students ($M = 2.53$) scored significantly higher on the digital game addiction scale than female students ($M = 1.84$), indicating a notable gender-based variation in digital game addiction tendencies.

Table 8.
t-test Results For Reading Motivation Scale Scores By Gender

Gender	N	M	SD	df	t	p
Male	171	2.59	.64	372	8.412	.00
Female	153	3.05	.42			
Total	324	2.82	.53			

According to the data in the table, there is a significant difference in reading motivation scale scores among 4th-grade elementary school students by gender, $t_{(372)} = 8.412$, $p < .01$. This finding reveals a significant difference in reading motivation between male and female students. Female students have higher reading motivation scores ($M = 3.05$) compared to their male counterparts ($M = 2.59$).

Table 9.
t-test Results For Reading Comprehension Scores By Gender

Gender	N	M	SD	df	t	p
Male	171	58.04	11.53	372	7.95	.00
Female	153	66.00	10.36			
Total	324	62.02	10.94			

According to the tabulated data, a statistically significant difference was found in reading comprehension scores between male and female 4th-grade elementary school students, $t_{(372)} = 7.95$, $p < .01$. Female students ($M = 66.00$) demonstrated significantly higher reading comprehension scores compared to male students ($M = 58.04$), indicating a notable gender-based disparity in reading comprehension performance.

Discussion, Conclusion, and Suggestions

This study examines the relationships between digital game addiction, reading motivation, and reading comprehension levels among fourth-grade primary school students. A total of 374 students completed two scales and a reading comprehension test. The results revealed a moderate negative relationship between digital game addiction and reading motivation. The literature also supports these findings; for example, Şahin et al. (2022) investigated the relationship between reading attitudes and digital game addiction among 4th and 5th-grade students and discovered a negative correlation between students' game addiction and their reading attitudes. Similarly, Fazla et al. (2019) observed a decline in reading habits and reading duration among high school students as technology became more widespread. It was found that students who lacked reading habits exhibited higher levels of smartphone addiction compared to their peers with strong reading habits. Additionally, Sağır and Eraslan (2019) emphasized that the use of digital devices for reading among students was minimal and noted that smartphones and digitalization have diminished the impact of reading culture among young people. The findings of this study align with the existing literature, which highlights the negative impact of digital technologies on reading attitudes and habits.

The internet, one of the indispensable technologies of the modern age, meets the needs of individuals across a wide age range while particularly capturing the constant interest of children and adolescents, encouraging their active internet use (Şimşek & Karakuş Yılmaz, 2020). Today, the preference for digital games over traditional games (Levin, 2015) has led children to move away from fundamental skills. Digital games are interactive software played on various electronic platforms (computers, gaming consoles, mobile devices, etc.) that require players' active participation and interaction, serving purposes such as entertainment, learning, or social interaction (Martinez-Garza, Clark, Killingsworth, & Adams, 2016). This growing preference among children has transformed into digital game addiction, potentially creating negative effects on reading skills. Considering that digital game addiction negatively impacts daily life (Weinstein, 2010), it is evident that this effect extends to children's reading skills as well.

Another finding of the study is that there is a moderate negative relationship between students' digital game addiction and their reading comprehension levels. Although studies directly addressing the connection between digital game addiction and reading comprehension are limited, there is a significant body of research examining the relationship between digital game addiction and academic achievement. Delebe and Hazar (2022) aimed to determine the level of digital game addiction among middle school students in relation to certain physical parameters and academic achievement. As a result, a statistically significant negative relationship was observed between participants' levels of digital game addiction and their academic performance. Drummond and Sauer (2014) analyzed data from over 192,000 students from 22 countries participating in the 2009 International Student Assessment Program and found that digital games negatively affected achievement in science, mathematics, and reading courses. Similarly, Eyimaya et al. (2020) emphasized that digital game addiction leads to both academic failure and health risks. Additionally, studies conducted by Chiu et al. (2004), Anand (2007), Gentile (2009), Gentile et al. (2004), and Sharif and Sargent (2006) suggested that participants who spent more time playing digital games exhibited lower academic achievement. It is generally accepted that individuals with digital game addiction struggle with issues such as ineffective use of free time, avoidance of social interaction, and a decline in academic performance (Ataman-Yengin, 2019; Doğan, 2006; Horzum, 2011). Digital game addiction can negatively impact not only academic achievement but also fundamental cognitive skills such as reading comprehension. Attention deficits, concentration difficulties, and decreased reading habits can make it harder for students to understand academic materials. This situation may lead to poor academic performance, low grades, and a loss of motivation, ultimately damaging students' self-confidence.

Another finding of the study is that there is a moderate positive relationship between reading motivation and reading comprehension. In other words, as students' reading motivation increases, their reading comprehension levels also improve. A study conducted by Yıldız and Akyol (2011) revealed that intrinsic motivation has a positive effect on reading comprehension. Intrinsic motivation helps students develop the cognitive and emotional skills necessary for understanding what they read. A high level of curiosity and interest in reading increases students' attention to the reading process, enabling them to participate more effectively in reading activities (Yıldız & Akyol, 2011). This encourages students to make more effort to comprehend texts and allows them to use their cognitive skills effectively during the reading comprehension process. Similarly, Batmaz and Erdoğan (2019) examined teachers' perspectives to explain the relationship between reading motivation and reading comprehension skills among fourth-grade students. Their research revealed a significant and strong relationship between reading motivation and reading comprehension skills among fourth-grade students. These findings are consistent with other related studies. Additionally, similar relationships between reading motivation and reading comprehension have been identified in numerous other studies (Gottfried, 1990; Wang & Guthrie, 2004; Wigfield & Guthrie, 1997; Yamaç & Çeliktürk Sezgin, 2018; Yıldız & Akyol, 2011; Yıldız, 2013). Based on these findings, it is evident that motivation has a positive impact on reading comprehension.

Additionally, the study revealed a significant difference in digital game addiction between male and female students, with male students exhibiting higher addiction levels compared to their female peers. This finding is consistent with the results of a study conducted by Şahin et al. (2022), which indicated that fourth-grade male students had higher levels of digital game addiction than their female counterparts. Similarly, Şahin and Tuğrul (2012) reported that male students exhibited higher levels of addiction, reaching similar conclusions. These results support and reinforce previous research findings. Another noteworthy finding is the difference in reading motivation between male and female students; female students demonstrated higher motivation compared to male students. Kızıgın and Baştuğ (2020) found that female students had higher reading motivation, which was also a predictor of academic success. Likewise, Yıldız (2013) observed that while intrinsic motivation levels were similar among third, fourth, and fifth-grade male and female students, female students exhibited higher levels of extrinsic motivation compared to males. Goodwin et al. (2012), in their research on elementary school students, reported that girls had higher intrinsic reading motivation than boys. Katrancı (2015) found that fourth-grade female students had stronger motivation for reading books compared to males. Additionally, Wigfield and Guthrie (1997) discovered that fourth- and fifth-grade female students had higher reading motivation than their male counterparts. The greater interest of male students in digital games may be attributed to biological, psychological, and sociocultural factors. Games provide males with opportunities to build self-confidence and relieve stress, while sociocultural influences and marketing strategies further support this interest. Additionally, male students can strengthen their social bonds through gaming.

In light of these findings, another important issue that needs to be addressed is parental control. Parents play a crucial role in introducing children to digital games and guiding them through the process of playing these games during early childhood (Budak & Işıkoğlu, 2022). Children are exposed to digital devices in their environment and have a desire to use them (Toran et al., 2016). This interest, which starts at a very early age, can continue to grow over time. It is known that when digital tools are used effectively, they can support children's development and learning (Canbeldek, 2020; Hirsh-Pasek et al., 2015). Parents need to guide their children to determine whether digital applications support their learning (Gözüm & Kandır, 2021). During this guidance process, parents can monitor whether the digital applications their children use contain educational content (Gözüm & Kandır, 2020). By monitoring the content of the games their children play, they can encourage them to engage in educational games, thus contributing to their academic success.

Based on these findings, the following recommendations are offered:

- To reduce the negative impact of digital game addiction on reading motivation and reading comprehension, parents and teachers should provide guidance to children. The time spent on digital games should be controlled, and children should be directed toward educational games. Additionally, family reading habits should be supported to encourage children to engage more with books.

- To increase reading motivation, students should be encouraged to choose books that align with their interests. Schools can foster reading habits by organizing book clubs, reading competitions, and creative writing activities. Books on topics that might particularly interest male students can be suggested to boost their reading motivation.
- Parents should regularly review the digital games their children play and guide them toward educational content. Family media planning should be implemented to ensure that children spend balanced time between digital and traditional activities. In this way, while digital game addiction is controlled, academic success and reading habits can be supported

Acknowledgment

Copyrights: The works published in the e-Kafkas Journal of Educational Research are licensed under a Creative Commons Attribution-Non-commercial 4.0 International License.

Ethics statement: This study adheres to the ethical standards set forth in the "Higher Education Institutions Scientific Research and Publication Ethics Directive." Furthermore, it does not engage in any actions that contravene the "Actions Against Scientific Research and Publication Ethics." Furthermore, we confirm that there is no conflict of interest between the authors, who all contributed to the study, and that all responsibility for any ethical violations rests with the article authors.

Author Contributions: Conceptualisation, Şafak Kaman; methodology, Şafak Kaman; validation, Aydın Bulut; analysis, Aydın Bulut; writing, review and editing, Aydın Bulut and Şafak Kaman.

Funding: This research received no funding.

Institutional Review Board Statement: In order to conduct the research, ethical approval was obtained from Kastamonu University Social and Human Sciences Ethics Committee with the decision dated 08/05/2024 and numbered 05/34.

Data Availability Statement: The data obtained during the study can be requested from the authors if needed.

Conflict of Interest: The authors have no competing interests.

Generative Artificial Intelligence Statement: ChatGPT was used for language editing.

References

- Akyol, H. (2005). *Türkçe ilköğretim ve yazma öğretimi*. Ankara: Pegem Akademi.
- Akyol, H. (2021). *Türkçe öğretim yöntemleri*. Ankara: Pegem Akademi.
- Anand, V. (2007). A study of time management: The correlation between video game usage and academic performance markers. *CyberPsychology & Behavior*, 10(4), 552-559. doi:10.1089/cpb.2007.9991
- Arslan, A., & Polat, M. S. (2025). The relationship between reading habits and critical thinking tendencies of primary school students. *National Education*, 54(245), 321-354. doi: 10.37669/milliegitim.1506770
- Aslan, H. Başçılar, M., & Karataş, K. (2022). The relationship between digital game addiction and social skills in adolescents. *Addiction Journal*, 23(3), 266-274. doi:10.51982/bagimli.1033761
- Ataman-Yengin, D. (2019). Digital game addiction. G. H. Karadağ (Ed.), *Digital diseases* (ss. 117-135). Der Publications.
- Ataş, M. (2015). *İlkokul öğrencilerinin okuma motivasyonlarının bazı değişkenler açısından incelenmesi*. [Unpublished master's thesis]. Karadeniz Teknik Üniversitesi, Trabzon.
- Baker, T., & Wigfield, A. (1999). Dimensions of children's motivation for reading and their relations to reading activity and reading achievement. *Reading Research Quarterly*, 34, 2-29. doi.org/10.1598/RRQ.34.4.4
- Bardelli, S., Del Corso, G., Ciantelli, M., Del Pistoia, M., Lorenzoni, F., Fossati, N., & Cuttano, A. (2022). Improving pediatric/neonatology residents' newborn resuscitation skills with a digital serious game: DIANA. *Frontiers in pediatrics*, 10, 1-17. doi.org/10.3389/fped.2022.842302
- Batmaz, O., & Erdoğan, Ö. (2019). The relationship between reading motivation and reading comprehension skills of 4th grade primary school students and teachers' opinions on this issue. *Electronic Journal of Social Sciences*, 18(71), 1429-1449. doi:10.17755/esosder.529255
- Block, C. C. (2004). *Teaching comprehension*. Allyn and Bacon
- Bulut, A. (2021). *Bilgisayar destekli ve doğrudan strateji öğretiminin okuduğunu anlama üzerindeki etkisi* [Unpublished doctoral dissertation]. Gazi Üniversitesi, Ankara.
- Büyüköztürk, Ş. (2014). *Sosyal bilimler için veri analizi el kitabı: istatistik, araştırma tasarımı, spss uygulamaları ve yorumlama*. Ankara: Pegem Akademi.
- Canbeldek, M. (2020). *Erken çocukluk eğitiminde kodlama ve robotik eğitim programı üreten çocukların etkilerinin araştırılması*. [Unpublished doctoral dissertation]. Pamukkale Üniversitesi, Denizli.
- Cankurtaran, F., Menevşe, O., Namlı, A., Kızıltoprak, H. Ş., Altay, S., Duran, M., & Ekşi, C. (2022). The impact of digital game addiction on musculoskeletal system of secondary school children. *Nigerian Journal of Clinical Practice*, 25(2), 153-159. doi.org/10.4103/njcp.njcp_177_20
- Chen, C. C., & Tu, H. Y. (2021). The effect of digital game-based learning on learning motivation and performance under social cognitive theory and entrepreneurial thinking. *Frontiers in psychology*, 12, 750711. doi.org/10.3389/fpsyg.2021.750711
- Chen, H. L., & Chuang, Y. C. (2021). The effects of digital storytelling games on high school students' critical thinking skills. *Journal of Computer Assisted Learning*, 37(1), 265-274. doi.org/10.1111/jcal.12487
- Chen, H. L., & Wu, C. T. (2023). A digital role-playing game for learning: Effects on critical thinking and motivation. *Interactive Learning Environments*, 31(5), 3018-3030. doi.org/10.1080/10494820.2021.1916765

- Chen, H. R., & Lin, Y. S. (2016). An examination of digital game-based situated learning applied to Chinese language poetry education. *Technology, Pedagogy and Education*, 25(2), 171-186. doi.org/10.1080/1475939X.2015.1007077
- Chen, P. Y., Hwang, G. J., Yeh, S. Y., Chen, Y. T., Chen, T. W., & Chien, C. H. (2022). Three decades of game-based learning in science and mathematics education: an integrated bibliometric analysis and systematic review. *Journal of Computers in Education*, 9(3), 455-476. doi.org/10.1007/s40692-021-00210-y
- Chen, Y. (2023). The effect of using a game-based translation learning app on enhancing college EFL learners' motivation and learning experience. *Education and Information Technologies*, 28(1), 255-282. doi.org/10.1007/s10639-022-11174-6
- Chiu, S. Lee, J., & Huang, D. (2004). Video game addiction in children and teenagers in Taiwan. *Cyberpsychol Behav*, 7, 571-581. doi:10.1089/cpb.2004.7.571
- Clinton-Lisell, V., Taylor, T., Carlson, S. E., Davison, M. L., & Seipel, B. (2022). Performance on reading comprehension assessments and college achievement: a meta-analysis. *Journal of College Reading and Learning*, 52(3), 191-211. doi:10.1080/10790195.2022.2062626
- Dai, C. P., Ke, F., & Pan, Y. (2022). Narrative-supported math problem solving in digital game-based learning. *Educational technology research and development*, 70(4), 1261-1281. doi.org/10.1007/s11423-022-10129-5
- Delebe, A., & Hazar, Z. (2022). Investigation of digital game addiction level of middle school students according to some physical parameters and academic achievement. *Spormetre Journal of Physical Education and Sports Sciences*, 20(3), 55-68. doi:10.33689/spormetre.1061035
- Demirel, Ö. (1999). *İlköğretim okullarında Türkçe öğretimi*. İstanbul: MEB.
- Deng, L., Wu, S., Chen, Y., & Peng, Z. (2020). Digital game-based learning in a Shanghai primary-school mathematics class: A case study. *Journal of Computer Assisted Learning*, 36(5), 709-717. doi.org/10.1111/jcal.12438
- DeSmet, A., Bastiaensens, S., Van Cleemput, K., Poels, K., Vandebosch, H., Deboutte, G.,... & De Bourdeaudhuij, I. (2018). The efficacy of the Friendly Attac serious digital game to promote prosocial bystander behavior in cyberbullying among young adolescents: A cluster-randomized controlled trial. *Computers in Human Behavior*, 78, 336-347. doi.org/10.1016/j.chb.2017.10.011
- Doğan, F. Ö. (2006, October). Video games and children: violence in video games. In *New/Yeni Symposium Journal* 44(4), 161-164.
- Drummond, A., & Sauer, J. D. (2014). Video-games do not negatively impact adolescent academic performance in science, mathematics or reading. *PloS one*, 9(4), e87943. doi:10.1371/journal.pone.0087943
- Eyimaya, A. Ö., Uğur, S., Sezer, T. A., & Tezel, A. (2020). Investigation of digital game addiction in elementary school 4th grade students according to sleep and some other variables. *Journal of Turkish Sleep Medicine*, 7(2), 83-90. doi: 10.4274/jtsm.galenos.2020.30502
- Fazla, S., Akcan, M., Sümer, O. N., & Gezgin, D. M. (2019, October). Examining the relationship between high school students' reading habits and smartphone addiction. *Paper presented at the VII. International Symposium on Instructional Technology and Teacher Education*, Antalya, Turkey.
- Fiorentini, A., & Berardi, N. (1980). Perceptual learning specific for orientation and spatial frequency. *Nature*, 287, 43-44. doi:10.1038/287043a0
- Froland, T. H., Heldal, I., Braseth, T. A., Nygard, I., Sjøholt, G., & Ersvaer, E. (2022). Digital game-based support for learning the phlebotomy procedure in the biomedical laboratory scientist education. *Computers*, 11(5), 1-20. doi.org/10.3390/computers11050059

- Fu, Q. K., Zou, D., Xie, H., Cheng, G., & Hwang, G. J. (2022). Effects of a collaborative design approach on pre-service teachers' ability of designing for learning with a digital game. *Education and Information Technologies*, 27(4), 5641-5664, 1-24. doi.org/10.1007/s10639-021-10818-3
- Gentile, D. (2009). Pathological video-game use among youth ages 8 to 18: a national study. *Psychological Science*, 20(5), 594-602. doi:10.1111/j.1467-9280.2009.02340.x
- Gentile, D. A., Lynch, P. J., Linder, J. R., & Walsh, D. A. (2004). The effects of violent video game habits on adolescent hostility, aggressive behaviors, and school performance. *Journal of Adolescence*, 27(1), 5-22. doi:10.1016/j.adolescence.2003.10.002
- George, D., & Mallery, M. (2010). *SPSS for Windows step by step: A simple guide and reference* (10a ed.). Pearson.
- Goli, A., Teymournia, F., Naemabadi, M., & Garmaroodi, A. A. (2022). Architectural design game: A serious game approach to promote teaching and learning using multimodal interfaces. *Education and Information Technologies*, 1-32. doi.org/10.1007/s10639-022-11062-z
- Goodwin, H., Henderson, N., McGeown, S., & Wright, P. (2012). Gender differences in reading motivation does sex or gender identity provide a better account. *Journal of Research in Reading*, 35(3), 328-336. doi:10.1111/j.1467-9817.2010.01481.x
- Gottfried, A. E. (1990). Academic intrinsic motivation in young elementary school children. *Journal of Educational Psychology*, 82(3), 525-538. doi:10.1037/0022-0663.82.3.525
- Gözüm, A. İ. C., & Kandır, A. (2020). Developing a parental mediation scale of digital games for children. *International Journal of Curriculum and Instruction*, 12(2), 336-358.
- Gözüm, A. İ. C., & Kandır, A. (2021). Digital games pre-schoolers play: parental mediation and examination of educational content. *Education and Information Technologies*, 26(3), 3293-3326.
- Green, C. S., & Bavelier, D. (2014). The cognitive neuroscience of video games. *Digital Media: Transformations in Human Communication*, 1(1), 1-32.
- Güneş, F. (2007). *Türkçe öğretimi zihinsel yapılandırma*. Nobel Yayın Dağıtım.
- Guthrie, J. T., Wigfield, A., Metsala, J. L., & Cox, K. E. (1999). Motivational and cognitive predictors of text comprehension and reading amount. *Scientific Studies of Reading*, 5(3), 231-256. doi:10.1207/s1532799xssr0303_3
- Harris, A. J., & Sipay, E. R. (1990). *How to increase reading ability: a guide to developmental & remedial methods*. New York: Longman.
- Hazar, Z., & Hazar, M. (2017). Digital game addiction scale for children. *Journal of Human Sciences*, 14(1), 203-216. doi:10.14687/jhs.v14i1.4387
- Hebert, C., Jenson, J., & Terzopoulos, T. (2021). "Access to technology is the major challenge": Teacher perspectives on barriers to DGBL in K-12 classrooms. *E-Learning and Digital Media*, 18(3), 307-324. doi.org/10.1177/2042753021995315
- Hirsh-Pasek, K., Zosh, J. M., Golinkoff, R. M., Gray, J. H., Robb, M. B., & Kaufman, J. (2015). Putting education in "educational" apps: Lessons from the science of learning. *Psychological Science in the Public Interest*, 16(1), 3-34. doi.org/10.1177/1529100615569721.
- Homer, B. D., Ober, T. M., Rose, M. C., MacNamara, A., Mayer, R. E., & Plass, J. L. (2019). Speed versus accuracy: Implications of adolescents' neurocognitive developments in a digital game to train executive functions. *Mind, Brain, and Education*, 13(1), 41-52. doi.org/10.1111/mbe.12189
- Horzum, (2011). Investigation of computer game addiction levels of primary school students according to various variables. *Education and Science*, 36(159), 56.

- Hu, T., Ouyang, M., Zhang, Z., & Wang, C. Y. (2022). From the main-melody story to gaming experience: is the Chinese digital game arena a potential counterpublic sphere? *Media, Culture & Society*, 44(5), 986-1002. doi.org/10.1177/01634437221079562
- Huh, Y. J. (2017). Uncovering young children's transformative digital game play through the exploration of three-year-old children's cases. *Contemporary Issues in Early Childhood*, 18(2), 179-195. doi.org/10.1177/1463949117714080
- Junttila, K., Smolander, A. R., Karhila, R., Giannakopoulou, A., Uther, M., Kurimo, M., & Ylinen, S. (2022). Gaming enhances learning-induced plastic changes in the brain. *Brain and Language*, 230. doi.org/10.1016/j.bandl.2022.105124
- Just, M. A., & Carpenter, P. A. (1980). A theory of reading: from eye fixations to comprehension. *Psychological Review*, 87(4), 329-354. doi:10.1037/0033-295X.87.4.329
- Justice, L. M., & Kaderavek, J. N. (2004). Embedded-explicit emergent literacy intervention I. *Language, Speech, and Hearing Services in Schools*, 35(3), 201-211.
- Kaimara, P., Fokides, E., Oikonomou, A., & Deliyannis, I. (2021). Potential barriers to the implementation of digital game-based learning in the classroom: Pre-service teachers' views. *Technology, Knowledge and Learning*, 26(4), 825-844. doi.org/10.1007/s10758-021-09512-7
- Karabulut, B. (2019). *Ortaokul öğrencilerinde dijital oyun bağımlılığı ve şiddet eğilimi arasındaki ilişki* [Unpublished master's thesis]. Hasan Kalyoncu Üniversitesi, Gaziantep.
- Karasar, N. (2020). *Bilimsel araştırma yöntemleri*. Ankara: Pegem Akademi.
- Karni, A., & Sagi, D. (1991). Where practice makes perfect in texture discrimination: Evidence for primary visual cortex plasticity. *Proc Natl Acad Sci USA*, 88(11), 4966-4970. doi:10.1073/pnas.88.11.4966
- Katrancı, M. (2015). Investigation of fourth grade primary school students' motivation to read books. *Mother Language Education Journal*, 3(2), 49-62.
- Kent, A. M. (2002). *An evaluation of the reading comprehension strategies module of the alabama reading initiative with five elementary schools in southwest Alabama* [Doctoral dissertation]. University of South Alabama.
- Kızgın, A., & Baştuğ, M. (2020). The level of reading motivation and reading comprehension skills predicting academic achievement. *Journal of Language Education and Research*, 6(2), 601-612. doi:10.31464/jlere.767022
- Korand, S., Fung, C. C., Cohen, S., Talbot, T. B., Fischer, S., Luu, C., Sargsyan, M., Ben-Isaac, E., Espinoza, J., & Chang, T. P. (2022). The Association Between Multitasking and Multi-Patient Care Skills in a Simulated Patient Care Video Game Among Second Year Medical Students Based on Specialty Choice. *Simulation & Gaming*, 53(4), 335-352. doi.org/10.1177/10468781221103460
- Lee, Y. N., & Zhu, M. (2022). Digital game-based learning can develop students' literacy skills and meet learning standards in the US. *Computers in the Schools*, 1-23. doi.org/10.1080/07380569.2022.2075163
- Levin, D. E. (2015). Technology play concerns. In D. P. Fromberg ve D. Bergen (Eds.), *Play from birth to twelve : Contexts, perspectives, and meanings* (pp.225-232). New York : Routledge
- Liu, Y. J., Zhou, Y. G., Li, Q. L., & Ye, X. D. (2022). Impact study of the learning effects and motivation of competitive modes in gamified learning. *Sustainability*, 14(11), 6626. doi.org/10.3390/su14116626
- Mahat, J., Alias, N., & Yusop, F. D. (2023). Systematic literature review on gamified professional training among employees. *Interactive Learning Environments*, 31(10), 6747-6767. doi.org/10.1080/10494820.2022.2043910

- Martinez-Garza, M. M., Clark, D. B., Killingsworth, S. S., & Adams, D. M. (2016). *Beyond fun: Pintrich, motivation to learn, and games for learning*. In M. L. Niess & H. Gillow-Wiles (Eds.), *Handbook of research on gaming trends in P-12 education* (1–32). IGI Global.
- Mattsson, P., & Laike, T. (2022). Young children's learning about lighting and turn-off behaviour in preschool environments. *Energy and Buildings*, 268, 112-193. doi.org/10.1016/j.enbuild.2022.112193
- Meneghetti, C., Carretti, B., & De Beni, R. (2006). Components of reading comprehension and scholastic achievement. *Learning and Individual Differences*, 16(4), 291-301. doi:10.1016/j.lindif.2006.11.001
- Mukund, V., Sharma, M., Srivastva, A., Sharma, R., Farber, M., & Chatterjee Singh, N. (2022). Effects of a digital game-based course in building adolescents' knowledge and social-emotional competencies. *Games for Health Journal*, 11(1), 18-29. doi.org/10.1089/g4h.2021.0138
- Mustafaoğlu R., & Yasacı Z. (2018) The negative effects of digital gaming on children's mental and physical health. *Journal of Addiction*, 19(3): 51-58.
- Mutlu Bozkurt, T. (2022). Does education level matter in digital game addiction? Level of education and digital game addiction. *Journal of Sports, Health and Education Research*, 1(2), 22-35.
- National Reading Panel (2000). *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction*. National Institute of Child Health and Human Development. Washington
- Oakhill, J., & Cain, K. (2000). Childrens's difficulties in text comprehension: assessing causal issues. *Journal of Deaf Studies and Deaf Education*, 5(1), 51-59. doi:10.1093/deafed/5.1.51
- Pan, Y., Ke, F., & Xu, X. (2022). A systematic review of the role of learning games in fostering mathematics education in K-12 settings. *Educational Research Review*, 36. doi.org/10.1016/j.edurev.2022.100448
- Pardo, L. S. (2004). What every teacher needs to know about comprehension. *The Reading Teacher*, 58(3), 272-280. doi:10.1598/RT.58.3.5
- Pill, S., Hyndman, B., SueSee, B., & Williams, J. (2019). Physical education teachers' use of digital game design principles. *Journal of Teaching in Physical Education*, 40(1), 1-9. doi.org/10.1123/jtpe.2019-0036
- Raynal, A., Lavigne, H., Goldstein, M., & Gutierrez, J. (2022). Starting with Parents: Investigating a Multi-Generational, Media-Enhanced Approach to Support Informal Science Learning for Young Children. *Early Childhood Education Journal*, 50(5), 879-889. doi.org/10.1007/s10643-021-01209-x
- Rose, D. S., Parks, M., Androea, K., & McMahon, S. D. (2000). Imagery-based learning: improving elementary students' reading comprehension with drama techniques. *The Journal of Educational Research*, 94(1), 54-63. doi.org/10.1080/00220670009598742
- Sağır, A., & Eraslan, H. (2019). The impact of smartphones on young people's daily lives: The case of university youth in Turkey. *OPUS International Journal of Society Researches*, 10(17), 48-78. doi:10.26466/opus.515339
- Şahin, C., & Tuğrul, V., M. (2012). İlköğretim öğrencilerinin bilgisayar oyunu bağımlılık düzeylerinin incelenmesi. *Journal of World of Turks*, 4(3), 115-130.
- Şahin, G., Demir, T., Kümüş, Ö., & Kepenek, N. (2022). İlkokul dördüncü sınıf öğrencilerinde bilgisayar oyun bağımlılığı ile okumaya yönelik tutumlar arasındaki ilişkinin incelenmesi. *Rumeli Eğitim Araştırmaları Dergisi*, 2, 18-29. doi:10.53688/re.3

- Salgarayeva, G. I., Iliysova, G. G., Makhanova, A. S., & Abdrayimov, R. T. (2021). The effects of using digital game based learning in primary classes with inclusive education. *European Journal of Contemporary Education*, 10(2), 450-461. doi.org/10.13187/ejced.2021.2.450
- Santos Chagas, C. M., Melo, G. R. S., Botelho, R. B. A., & Toral, N. (2020). Effects of the Rango Cards game intervention on food consumption, nutritional knowledge and self-efficacy in the adoption of healthy eating practices of high school students: a cluster randomised controlled trial. *Public Health Nutrition*, 23(13), 2424-2433. doi.org/10.1017/S1368980020000531
- Sarkar, A., & Sarkar, J. G. (2022). Gift of fantasy: investigating how fantasy in digital game impacts game brand immersion. *Information Technology & People*, 36(2), 661-682. doi.org/10.1108/ITP-11-2020-0809
- Sharif, I., & Sargent, J. D. (2006). Association between television, movie, and video game exposure and school performance. *Pediatrics*, 118(4). doi:10.1542/peds.2005-2854
- Şimşek, E., & Karakuş Yılmaz, T. (2020). Systematic review of methods and results in digital game addiction studies conducted in Turkey. *Kastamonu Education Journal*, 28(4), 1851-1866. doi.org/10.24106/kefdergi.3920
- Smith, R., Kelly, B., Yeatman, H., Moore, C., Baur, L., King, L., ... & Bauman, A. (2020). Advertising placement in digital game design influences children's choices of advertised snacks: A randomized trial. *Journal of the Academy of Nutrition and Dietetics*, 120(3), 404-413. doi.org/10.1016/j.jand.2019.07.017
- Swanson, H. L., Howard, C. B., & Sáez, L. (2007). *Reading comprehension and working memory in children with learning disabilities in reading*. In K. Cain & J. Oakhill (Eds.), *Children's comprehension problems in oral and written language: A cognitive perspective* (pp. 157–185). The Guilford Press.
- Tang, J. T. (2021). A practical action research of portfolio assessment on building the learning community for graduate students in Taiwan. *Systemic Practice and Action Research*, 1-24. doi.org/10.1007/s11213-021-09583-8
- Tay, J., Goh, Y. M., Safiena, S., & Bound, H. (2022). Designing digital game-based learning for professional upskilling: A systematic literature review. *Computers & Education*, 184. doi.org/10.1016/j.compedu.2022.104518
- Teng, C. I., Huang, T. L., Yang, Z. H., Wu, W. J., & Liao, G. Y. (2022). How strategic, offensive, and defensive engagement impact gamers' need satisfaction, loyalty, and game usage. *International Journal of Information Management*, 66. 102515. doi.org/10.1016/j.ijinfomgt.2022.102515
- Thai, K. P., Bang, H. J., & Li, L. (2022). Accelerating early math learning with research-based personalized learning games: A cluster randomized controlled trial. *Journal of Research on Educational Effectiveness*, 15(1), 28-51. doi.org/10.1080/19345747.2021.1969710
- Toran, M., Ulusoy, Z., Aydin, B., Deveci, T., & Akbulut, A. (2016). Çocukların dijital oyun kullanımına ilişkin anne görüşlerinin değerlendirilmesi. *Kastamonu Eğitim Dergisi*, 24(5), 2263-2278.
- Tuncay, B., & Göger, B. (2022). Investigation of the relationship between digital game addiction and sleep quality in adolescents. *Journal of Turkish Sleep Medicine*, 9(1), 79-84. doi:10.4274/jtsm.galenos.2021.52207
- Türkben, T., & Gündeğer, C. (2021). The relationship between fifth grade students' reading comprehension, reading motivation and attitudes towards Turkish course. *Journal of Native Language Education*, 9(3), 871-888.
- Ürün-Karahan, B., & Taşdan, M. (2016). The correlation of attitudes and motivations of 5th and 6th grade students toward reading with the skills of reading comprehension. *International Journal of Turkish Literature, Culture and Education*, 5(2), 949-969.

- Uyanık, Ö., & Kandır, A. (2010). Early academic skills in preschool period. *Journal of Theoretical Educational Science*, 3(2), 118-134.
- Van den Broek, P., & Espin, C.A. (2012). Connecting cognitive theory and assessment: measuring individual differences in reading comprehension. *School Psychology Review*, 41(3), 315-325. doi:10.1080/02796015.2012.12087512
- Veraksa, A., Sukhikh, V., Veresov, N., & Almazova, O. (2022). Which play is better? Different play types and development of executive functions in early childhood. *International Journal of Early Years Education*, 30(3), 560-576. doi.org/10.1080/09669760.2022.2091979
- Veresov, N., & Veraksa, N. (2023). Digital games and digital play in early childhood: a cultural-historical approach. *Early Years*, 43(4-5), 1089-1101. doi.org/10.1080/09575146.2022.2056880
- Wang, J. H., & Guthrie, T. J. (2004). Modeling the effect of intrinsic motivation, extrinsic motivation, amount of reading, and past reading achievement on text comprehension between U.S. and Chinese students. *Reading Research Quarterly*, 39(2), 162-186. doi:10.1598/RRQ.39.2.2
- Wang, M., & Zheng, X. (2021). Using game-based learning to support learning science: A study with middle school students. *The Asia-Pacific Education Researcher*, 30(2), 167-176. doi.org/10.1007/s40299-020-00523-z
- Wang, X. M., Wang, S. M., Wang, J. N., Hwang, G. J., & Xu, S. (2023). Effects of a two-tier test strategy on students' digital game-based learning performances and flow experience in environmental education. *Journal of Educational Computing Research*, 60(8), 1942-1968. doi.org/10.1177/07356331221095162
- Weinstein, A. M. (2010). Computer and Video Game Addiction: A Comparison between Game Users and Non-Game Users. *The American Journal of Drug and Alcohol Abuse*, 36(5), 268-276. doi.org/10.3109/00952990.2010.491879
- Wigfield, A., & Guthrie, J. T. (1997). Relations of children's motivation for reading to the amount and breadth of their reading. *Journal of Educational Psychology*, 89(3), 420-432. doi:10.1037/0022-0663.89.3.420
- Yamaç, A., & Çeliktürk, Sezgin, Z. (2018). The relationships between reading anxiety, fluency, motivation and reading comprehension of fourth grade primary school students. *Education and Science*, 43(194), 225-243. doi:10.15390/EB.2018.7555
- Yamazaki, K. (2018). Computer-assisted learning of communication (CALC): A case study of Japanese learning in a 3D virtual world. *ReCALL*, 30(2), 214-231. doi.org/10.1017/S0958344017000350
- Yang, J. C., & Kuo, W. C. (2022). A mobile game-based app to facilitate learners' motivation and achievement in learning Chinese reading activities: An individual differences perspective. *Journal of Computer Assisted Learning*, 38(5), 1448-1464. doi.org/10.1111/jcal.12698
- Yang, Y. F., Goh, A. P., Hong, Y. C., & Chen, N. S. (2023). Primary school students' foreign language anxiety in collaborative and individual digital game-based learning. *Computer Assisted Language Learning*, 36(8), 1587-1607. doi.org/10.1080/09588221.2021.2008979
- Yeo, S., Rutherford, T., & Campbell, T. (2022). Yeo, S., Rutherford, T., & Campbell, T. (2022). Understanding elementary mathematics teachers' intention to use a digital game through the technology acceptance model. *Education and Information Technologies*, 27(8), 11515-11536. doi.org/10.1007/s10639-022-11073-w
- Yıldız, M. (2013). Investigation of reading motivation of 3rd, 4th and 5th grade primary school students. *Education and Science*, 38(168), 260-271.
- Yıldız, M., & Aktaş, N. (2015). Reading Motivation and Reading Commitment Scale: Turkish adaptation study. *International Journal of Human Sciences*, 12(2), 1349-1365. doi:10.14687/ijhs.v12i2.3379

- Yıldız, M., & Akyol, H. (2011). İlköğretim 5. sınıf öğrencilerinin okuduğunu anlama, okuma motivasyonu ve okuma alışkanlıkları arasındaki ilişki. *Gazi Üniversitesi Gazi Eğitim Fakültesi Dergisi*, 31(3), 793-815.
- Zhang, C. (2022). Raising student motivation and interest in football through rich media platforms: the experience of China. *Interactive Learning Environments*, 1-13. doi.org/10.1080/10494820.2022.2091613.