Ortaokul Öğrencilerinin Eğitsel Dijital Oyunlar İle İlgili Görüşlerinin İncelenmesi-Ölçek Geliştirme ve Uygulama Çalışması

Investigation of Middle School Students' Opinions on Educational Digital Games- Scale Development and Implementation Study

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Abstract

The purpose of the research is to examine the opinions of secondary school students about educational digital games. The research was conducted using a mixed research method. In the quantitative part of the study, a scale was developed with 300 middle school students, and the developed scale was re-applied with the participation of 186 students. Scale development and scale application phases were carried out in online portals by the survey method. In the qualitative part of the study, a case study was conducted. In this context, an online semi-structured interview form was conducted with 35 participants out of 186 students to whom the scale was applied. The quantitative data collection tool of the study is the "Use of Educational Digital Games Scale", which was developed by the researchers and consists of 20 items. The scale, developed in a four-point Likert type, includes 14 positive and 6 negative items and consists of 2 factors. In the analysis of the data, frequencies and response percentages were determined for each of the 20 items in the scale, and their average scores were calculated. The qualitative data source of the study is the interview form. The data obtained from the interview form was subjected to qualitative analysis. According to the results obtained, students stated that educational digital games enriched their learning experiences, made lessons exciting and enjoyable, were useful in reinforcing what was learned, offered interesting and creative ways to learning experiences, supported socialization, and developed their imagination. The results of the study were compared with the results of similar studies in the literature, discussed, and suggestions were presented.

Keywords: *Educational digital games, digital awareness, educational material development*

Özet

Araştırmanın amacı, ortaokul öğrencilerinin eğitsel dijital oyunlar ile ilgili görüşlerinin incelenmesidir. Araştırma karma araştırma yöntemi kullanılarak bir çalışma yürütülmüştür. Çalışmanın nicel bölümünde 300 ortaokul öğrencisi ile bir ölçek geliştirilmiş ve geliştirilen ölçek 186 öğrencinin katılımı ile tekrar uygulanmıştır. Ölçek geliştirme ve ölçek uygulama aşaması online portallar üzerinden tarama yöntemi ile gerçekleştirilmiştir. Çalışmanın nitel bölümünde ise bir durum çalışması yürütülmüştür. Bu kapsamda ölçek uygulaması yapılan 186 öğrenci içinden 35 katılımcı ile online yarı yapılandırılmış bir görüşme yapılmıştır. Çalışmanın nicel veri toplama aracı araştırmacılar tarafından geliştirilen ve 20 maddeden oluşan, "Eğitsel Dijital Oyunlardan Yararlanma Ölçeği" dir. Dörtlü likert tipinde geliştirilen ölçekte 14 olumlu, 6 olumsuz madde yer almakta ve ölçek 2 faktörden oluşmaktadır. Verilerin analizinde ölçekte yer alan 20 maddenin her biri için ayrı ayrı frekans ve cevaplanma yüzdeleri belirlenmiş ve ortalama puanları hesaplanmıştır. Çalışmanın nitel veri kaynağı görüşme formudur. Görüşme formundan elde edilen veriler nitel analize tabi tutulmuştur. Elde edilen sonuçlara göre öğrenciler, eğitsel dijital oyunların öğrenme deneyimlerini zenginleştirdiğini, dersleri heyecan verici ve zevkli hale getirdiğini, öğrenilenleri pekiştirmekte faydalı olduğunu, öğrenme deneyimlerine ilginç ve yaratıcı yollar sunduğunu, sosyalleşmeyi desteklediğini ve hayal güçlerini geliştirdiğini belirtmişlerdir. Çalışmanın sonuçları literatürdeki benzer çalışmaların sonuçları ile karşılaştırılarak tartışılmış ve öneriler sunulmuştur.

Anahtar Kelimeler: *Eğitsel dijital oyunlar, dijital farkındalık, eğitsel materyal geliştirme*

INTRODUCTION

Since the beginning of its existence, human beings have sought ways to increase their knowledge in line with their needs. With this quest, technological development has accelerated. Education is one of the areas where the effects of developments in science and technology are seen most intensely. Education has developed in parallel with technology.

When it comes to education, the first child comes to mind, and when it comes to children, the first play comes to mind. The play has an essential place in the development of children's personalities. The play, which develops and matures children's emotional intelligence, also includes learning. Children learn by doing and experiencing through play. According to Yalın (2008), learning depends on students' attitudes and desire to succeed. In addition, learning can vary according to students' capacity, learning style, and comprehension speed. Learning by living and practicing ensures permanent and perfect learning (İşman, 2001). Studies show that students can embody abstract concepts through play and that many subjects that are difficult to teach can be easily explained using games. Thus, the teacher has the opportunity to bring children together in productive and active learning settings where the desired gains are achieved (Ağırgöl, 2020).

Regarding all these, it may be beneficial to use games in education. Research has proven that learning with play in the early stages of education enhances the student's performance and attitude towards education (Randel & Morris, 1992). The game preferences of today's children, born into this technology and called the Z generation, have also kept up with the change (Görmez, 2020). Research reveals that today's children prefer digital games more due to the easy accessibility of computers and internet access (Demir, 2016).

The review of the studies in the literature indicates that digital games in education are the programs that define the user in a particular context, give them specific roles, and show the results of the given responsibilities and decisions (Erekmekçi & Fidan, 2012). Wang and Chen (2022) states that digital games have a profound potential to overcome difficulties in the educational process and positively affect students' learning outcomes and attitudes. These games have positive effects, including increasing practical thinking, strategy development, brain training, analytical thinking, and problem-solving. However, they also have negative features such as violence, obscenity, profanity, and uncontrolled advertising (Zengin 2019). Awareness is needed to benefit from their positive aspects rationally and to be less affected by negative aspects (Hazar,

2000). In this context, it is crucial that teachers, who are in control, have sufficient knowledge and experience about digital games, follow the innovations in this sector, explain how to benefit from digital games to their students, and even use these games to teach their lessons more effectively when appropriate. Because when children see that the learning activity is a game they are familiar with, they will be more attentive and motivated to participate in the learning activity (Görmez, 2020). Teachers' use of educational games in their lessons will also enable children to be more selective when choosing the digital games they play.

Aygün (2019) states that computer games come to mind first when talking about games, and therefore, using educational digital games will enable faster and easier access to the target behaviors prepared within the framework of the general objectives of the Ministry of National Education.

Rationale and Importance of the Study

The literature review highlights that educational digital games have already entered our educational materials, as they encourage scientific thinking and increase motivation towards the lesson (Varlık et al.,2025; Köroğlu & Yeşildere, 2004; Bayırtepe & Tüzün, 2007; Çelen et al., 2011; Hwang et al., 2012; Tsai et al., 2016; Chang et al., 2017). Even the early age group interacts with digital games, and children of all ages can spend long hours in games without getting bored, supporting this situation (Bayırtepe & Tüzün, 2007; Wang & Chen, 2010). Researchers state that educational digital games are an educational technology that can be preferred for all ages and developmental periods because they support the development of 21st-century skills (Basak et al., 2008).

Regarding the studies in the literature, there is a scale development study to determine teachers' attitudes towards using digital games (Görmez, 2020). The changes in attitudes towards science were measured in the studies where educational digital game activities were implemented instead of the effect of these practices (Ağırgöl, 2020).

No scale sought the opinions of the student groups on using digital educational games, which are the target audience of educational studies. This study will be the first to get students' opinions on the education process about using educational digital games in today's world, where technology has become indispensable in education, as in every field. It is believed to contribute to the literature by evaluating digital teaching materials from students' perspectives.

Aim and Problems of the Study

This study examines middle school students' opinions about educational digital games. For this purpose, the main problem statement of the study was set as "What are the opinions of middle school students about educational digital games?". The problems of the study are;

1. What are the findings regarding the factors obtained regarding educational digital games?

2. What are middle school students' opinions about using educational digital games?

METHOD

The main purpose of this study is to examine middle school students' opinions on educational digital games. In this context, the mixed method was used. Creswell (2013) states that the mixed method involves collecting and analyzing quantitative and qualitative data in a single study or multiple studies. The mixed research method specified by Creswell (2013) and the convergent parallel design were used in this study. Convergent parallel or simultaneous parallel design is a method in which qualitative and quantitative data are collected simultaneously. Then the results are combined and used to answer the research problem.

Figure 1

Convergent parallel design

The study consists of two parts, quantitative and qualitative. For the quantitative part, the "Utilization of Educational Digital Games Scale (UEDGS)" was developed to determine students' awareness and use of educational digital games. Tezbaşaran's (2008) Likert-type scale development steps were followed in this process. The scanning method, one of the quantitative research methods, was used to collect the data. Scanning describes the research subject (an event, individual, or object) as it is without affecting or changing it (Karasar, 2009; Özdemir, 2014). The scale took its final form after the necessary validity and reliability analyses. It was administered to a different

learning group to determine students' awareness of educational digital games. A case study was conducted in the qualitative part of the study, and the opinions of the study group on educational digital games were examined. In this context, a semi-structured interview form was used.

Study Group

The study group consists of students from a middle school in the province of Kayseri in the fall semester of the 2021-2022 academic year. 486 students participated in the quantitative part of the study. 300 students were involved in the scale development process. Then the scale was administered to 186 students from a different middle school in the same district. The students participating in the study were determined by random sampling, in which the selected sample represents the universe (Büyüköztürk et al., 2015). Among them, 35 students voluntarily participated in the qualitative part, where semi-structured interviews took place. The characteristics of the study group are shown in Table 1.

Table 1

Study Group Distribution

Method	Stage	f
Quantitative	Scale Development	300
	Scale Application	186
		Total: 486
Qualitative	Interview	35
		Total: 35

Data Collection Tools

Qualitative Data Collection Tools-Interview Form

The qualitative data source of this study is the interview form. An interview is a qualitative data collection tool that has recently been widely used in social sciences (Brinkmann, 2014). The first version of the form used within the scope of the study includes 5 questions, which are "What do you know about educational digital games?", "What comes to your mind when you hear the word educational game?", "What are your family's views on educational digital games?", "Do you use educational digital games in class? Can you give information? In which lessons do you use them the most?", "What topics would you like to write educational digital games for?".

In order to ensure the validity of the interview form, opinions of 3 experts were obtained. The experts interviewed have a doctorate degree in science education. The number of questions didn't change in the interview form after the expert's opinion.

The interview questions were directed to 35 students in writing via online portals. Participation in the interview process was voluntary.

Quantitative Data Collection Tools

UEDGS, developed by the researchers, was used to collect data. Likert-type scale development steps suggested by Tezbaşaran (2008) were used in developing the scale. In this context, five stages were followed: creating an item pool, getting expert opinions, pilot, factor analysis, and reliability analysis.

The scales used in similar studies were examined through a literature review while creating the item pool. The scales on using digital games and educational games were scanned (Görmez, 2020). Educational digital game experiences of three science teachers were taken.

Based on this information, the draft four-point Likert-type scale was developed; it consisted of 35 items. The draft scale was submitted to the opinion of measurement-evaluation, field, and language experts to be reviewed in terms of scope and validity, suitability of the items, and language use. The scale was reduced to 30 items by considering the expert opinions, and the pilots study was performed by applying it to 20 students.

The scale, which took its final form, was applied to a group of 300 students via online portals. Exploratory factor analysis (EFA) was performed on the data, and 10 items were removed from the scale because they were either not covered by any factor or overlapped with others. The final 20-item scale has two factors: the utilization of educational digital games and opinions about educational digital games.

As a result, a two-factor, 20-item scale containing 6 negative and 14 positive items was created. In addition, this scale was administered to another group of 186 students via online portals, and a confirmatory factor analysis (CFA) analysis was performed by the LISREL program. As a result of CFA, the RMSEA value of the scale was calculated as 0.046. The scale's reliability, whose construct validity was ensured by factor analysis, was found to be α=0.82 (Cronbach's Alpha reliability coefficient). As this value is above 0.7, it was concluded that the scale was reliable.

Data Analysis

Quantitative Data

In the analysis of the data obtained from the 20-item scale administered to 300 students, positive scale items were scored as "Strongly Disagree=1", "Somehow Agree

=2", "Agree= 3", and "Strongly Agree= 4". These statements' scores were reversed in negative items from 4 to 1. The formula (n-1)/n (4/3=0.75) was used to determine the evaluation categories in the scale (Metin, 2014). Accordingly, if the score obtained from an item is between 1.00-1.75, it is "Disagreed," between 1.76-2.50, "Somehow Agreed," between 2.51-3.25 "Agreed," and between 3.26-4.00 "Completely Agreed." There are 14 positive and 6 negative items in the scale.

The analysis of the data obtained within the scope of the study was performed on SPSS 25.00. Each item's frequencies, percentages (%), and averages (X) were calculated separately.

Qualitative Data

The qualitative data source of the study is the interviews. The obtained data were subjected to content analysis. Within this scope, the codes were determined. Then they were divided into themes, and similar themes were combined. In order to ensure the validity and reliability of the data obtained after the content analysis, a technique proposed by Huberman and Miles (2002) was applied, which envisages the repetition of descriptive analyses by more than one researcher and calculating the similarity ratio between them. The similarity between the analyses of the two researchers was calculated as 95%. For this purpose, an expert academician performed the descriptive analysis of the data. The similarity ratio between the codes and themes created by the researcher and those suggested by the expert was determined. In addition, some opinions of the participants, coded as S1, S2,…, were directly quoted.

Ethical Statement

This study was conducted in accordance with the ethical standards set forth in the 1964 Helsinki Declaration and its subsequent amendments.

FINDINGS

The findings of this study were presented in two categories, addressing the sub-problems of the study.

Findings of the First Problem

Since the scale has two factors, the factors are tabulated within themselves.The frequency, percentage, and means of the answers given for the nine items in UEDGS' utilization dimension are given in Table 2.

Table 2

The frequency, percentage, and means of the answers about utilization

	Factor 1: Utilization of Educational Digital Games	Strongly Disagree		Somehow Agree		Agree		Strongly Agree		Mean
		f	%	f	%	f	%	f	%	X
1	I cannot learn what I need to know about educational digital games alone.	47	25.3	82	44.1	39	21.0	18	9.7	2.85
2	Learning with educational digital games is exciting.	10	5.4	26	14.0	89	47.8	61	32.8	3.08
3	If I get the opportunity to play a popular educational digital game, I fear having problems navigating the game.	20	10.5	87	46.8	27	14.5	52	28.0	2.40
4	Educational digital games enrich my learning experiences.	7	3.8	13	7.0	103	55.4	63	33.9	3.19
5	I will have difficulty learning if a new subject is taught with an educational digital game.	13	7.0	19	10.2	97	52.7	57	30.6	1.94
6	Not having an experienced person with me makes me nervous when using an educational digital game.	54	29.0	93	50.0	25	13.4	14	7.5	3.01
7	Class time passes quickly, and it is fun when playing educational digital games.	11	5.9	22	11.8	70	37.6	83	44.6	3.21
8	I do not abstain from playing educational digital games.	14	7.5	14	7.5	101	54.3	57	30.6	3.08
9	I believe that I can solve a problem I encounter in an educational digital game	6	3.2	23	12.4	99	53.2	58	31.2	3.12
10	Educational digital games offer more exciting and creative ways to learn subjects.	3	1.6	22	11.8	94	50.5	67	36.0	3.21
11	The concern that "educational digital games can cause health problems" scares me.	17	9.1	67	36.0	72	38.7	30	16.1	2.38
12	Educational digital games make it easier for me to learn complex and abstract subjects.	9	4.8	30	16.1	97	52.2	50	26.9	3.01
13	I want to use educational digital games regularly throughout the school year.	13	7.0	27	14.5	82	44.1	64	24.4	3.06
14	The inclusion of educational digital games in lessons does not bother me.	10	5.4	15	8.1	84	45.2	77	41.4	3.23
15	I believe that educational digital games develop my imagination.	12	6.5	37	19.9	79	42.5	58	31.2	2.98
16	Educational digital games facilitate my learning by establishing connections between courses.	7	3.8	18	9.7	94	50.5	67	36.6	3.19

As seen in Table 2, the mean scores of the items in the utilization dimension were between 1.94 and 3.23. Accordingly, items 3, 5, and 11 of this subscale are in the "Somehow Agreed" category. Items 1, 2, 4, 6, 7, 8, 9, 10, 12, 13, 14, and 15 fall in the "Agreed" category. The items that students "Agree on" are, "I cannot learn what I need to know about educational digital games alone" ($\bar{X}$ =2.85), "Learning with educational digital games is exciting" ($\bar{X}$ =3.08), "Educational digital games enrich my learning experiences" ($\bar{X}$ =3.19), "Not having an experienced person with me makes me nervous when using an educational digital game" ($\bar{X}$ =3.01), "Class time passes quickly, and it is fun when playing

educational digital games" ($\bar{X}$ =3.21), "I do not abstain from playing educational digital games" ($\bar{X}$ =3.08), "I believe that I can solve a problem I encounter in an educational digital game" ($\bar{X}$ =3.12), "Educational digital games offer more exciting and creative to learn subjects" ($\bar{X}$ =3.21), "Educational digital games make it easier for me to learn complex and abstract subjects" ($\bar{X}$ =3.01), "I want to use educational digital games regularly throughout the school year" ($\bar{X}$ =3.06), "The inclusion of educational digital games in lessons does not bother me" ($\bar{X}$ =3.23), "I believe that educational digital games develop my imagination" ($\bar{X}$ =2.98), "Educational digital games facilitate my learning by establishing connections between courses " ($\bar{X}$ =3.19).

The frequency, percentage, and means of the answers given for the 6 items in UEDGS' opinion dimension are given in Table 3.

Table 3

The frequency, percentage, and means of the answers about opinions

	Factor 1: Opinions about Educational Digital Games	**Strongly Disagree**		**Somehow Agree**		**Agree**		**Strongly Agree**		**Ortalama**
16	Educational digital games make it easier for me to learn by establishing connections between courses.	7	3.8	18	9.7	94	50.5	67	36.6	3.19
17	Educational digital games support my socialization.	20	10.8	48	25.8	70	37.6	48	25.8	2.78
18	I enjoy learning a new educational digital game.	7	3.8	21	11.3	76	40.9	82	44.1	3.25
19	I think educational digital games help reinforce what I have learned.	8	4.3	16	8.6	94	50.5	68	36.6	3.19
20	I do not believe that educational digital games will increase my exam success.	76	40.9	82	44.1	7	3.8	21	11.3	3.15

Regarding Table 3, the mean scores of the items in the opinion dimension were between 2.78 and 3.25. Accordingly, the items of this subscale fall in the "Agreed" category.

The items that students "Agree on" are, "Educational digital games make it easier for me to learn by establishing connections between courses" ($\bar{X}$ =3.19), "Educational digital games support my socialization" ($\bar{X}$=2.78), "I enjoy learning a new educational digital game" ($\bar{X}$=3.25), "I think educational digital games are useful in reinforcing what I have learned." ($\bar{X}$=3.19), "I do not believe that educational digital games will increase my exam success" ($\bar{X}$=3.15).

Findings of the Second Problem

The second problem of the study involves the participants' opinions about educational digital games. In this context, an interview form was administered to 35 students. The

answers were subjected to qualitative analysis. The findings are summarized in Table 4.

Table 4

Analysis of the interview form

Category	Theme	Code	f	%
Awareness of educational games	Positive	I know	19	54
		I know and have played before	12	35
		I wrote a digital game	1	3
	Neutral	I don't know	4	11
Image of educational digital games	Positive	Enjoyable	18	51
		Different from traditional games	18	46
		It can contribute to my learning	10	28
		Facilitating	9	26
	Negative	Diverting	9	26
		Boring	8	23
		Simple	2	5
	Neutral	I don't know	2	5
Images of educational digital games in families	Negative	No idea	18	51
		Waste of time	16	45
		Useless	16	45
		Diverting	8	23
		Distracting	7	20
In-class effects of educational digital games	Positive	Positive	24	68
		Contributes to the visualization of information	18	51
		It makes it easy to repeat	12	35
		Effective	12	35
		Supports learning	8	23
		It can be applied in any course	7	20
		It can fill free time	5	14
	Negative	Diverting	6	17
		There is not enough time for each student	6	17
		After the first student, the answers are memorized	5	14
Courses that participants need educational games	Course	English	30	86
		Science	28	80
		Mathematics	22	63
		Religion	8	23
Topics that participants want to write educational digital games	Topic	Word matching	32	91
		Environmental pollution	18	51
		Harmful habits	11	31
		Electric	7	20
		Atom and subatomic particles	7	20

*The high total rates of frequency values are due to the fact that there is more than one answer from the same people.

Regarding Table 4, 89% of the participants are familiar with educational digital games. 35% of the participants stated that they had played an educational digital game before, and 1 participant stated that to had previously written an educational digital game.

They also stated that educational digital games are enjoyable (51%), different from traditional games (41%), and can contribute to the learning process (28%). In addition to the positive opinions, 9 participants stated that they are distracting, and 2 described educational digital games as "boring" because of being repetitive.

When the participants were asked about their parents' opinions, it was found that the parents did not know enough about educational digital games (51%). Other negative opinions from parents include seeing educational games as a waste of time (45%), distracting (23%), and diverting (20%).

The last data from the interviews reveal the areas where participants want to use educational digital games. They stated that educational digital games could be used in language education (86%) for memorizing words (91%), in science education (80%), and to raise awareness of environmental problems (51%). Below are sample participant comments.

S2: We played an educational digital game in science class before. Pretty enjoyable. It is effective in repeating the subject after learning it. However, the games get boring after a while because they end quickly. We memorize the answers right away.

S21: I wrote such a game before. My family thinks I am wasting time on the computer. I need time to develop.

S14: We play games in science classes, but there is not enough time for every student. Also, the answers are remembered after the first student.

S3: Educational games are effective in lessons. They help me repeat what I have learned. This way, I can make better use of my free time.

DISCUSSION AND CONCLUSION

This study, which investigates students' opinions about using educational digital games in science lessons, discusses participants' opinions in two dimensions: "Utilization of Educational Digital Games" and "Opinions about Educational Digital Games."

The findings of the utilization dimension show that students see educational digital games as supporting materials that enrich their learning experiences, provide convenience in learning abstract concepts, offer enjoyable learning experiences, establish connections between courses, and facilitate socialization. Students agreed that they enjoy learning new games and that educational digital games should be

included in the lessons.The study results are parallel to the literature. Dönel-Akgül and Kiliç (2020) indicate that participants in their studies expressed positive opinions about educational digital games. In the relevant study, participants stated that educational digital games make the lesson fun, make learning easier, and the subjects learned through games will be more permanent.

In addition, the results show that students need the support of an experienced person while playing educational digital games, are afraid of having problems in the game, and think that they will have difficulty learning a new subject only with this method.This may be due to students having difficulty playing educational digital games that they encounter for the first time.

Regarding the opinions about educational digital games, students strongly agree that they develop their imaginations; they also think these games are helpful and exciting course materials to reinforce what has been learned. Yıldız Durak and Karaoğlan Yılmaz (2019) stated in their study that such educational games improve creativityand problem-solving skills. This may be due to the fact that educational digital games facilitate learning by improving problem-solving skills. Çokyaman and Şimşek (2022) similarly pointed out in their study that educational digital games contributed to academic success. On the other hand, the results show that students cannot learn these materials alone and do not think they contribute to their exam success. Students also stated that they want to use educational digital games throughout the year.

In a study that supports the conclusion that educational digital games offer exciting and creative ways to learn subjects, Clark (2011) attempted to teach Newton's laws to students from two different countries, Taiwan (n=137) and the USA (n=72). A digital game-based method was used in the experimental group, and the traditional teaching method was used in the control group. As a result of the research, a positive change was observed in the academic achievement, class participation, and interest of experimental group students.

Bayırtepe and Tüzün (2007) applied the educational digital game they designed to middle school 7th-grade students and examined the effect of digital game-based teaching on students' academic success in computer lessons. They concluded that educational digital games enriched learning experiences, similar to this study. They reported that the group using the game-based teaching method liked the game-based teaching environment, their anxiety levels decreased while learning, and the game allowed them to learn individually. In his study, Bağcı stated that "Educational games enable students with low participation to become active in the lesson, allow them to

socialize and experience a sense of self-confidence" (Bağcı, 2011), which is in line with the conclusion of the current study that educational digital games support the socialization of students.

Another finding is that students stated they would have difficulty learning if the subject were taught using an educational digital game. In contrast, in Papastergio's study, digital game-based instruction was applied to one group to teach the concepts of basic computer memory units, and an educational platform on the Internet was used to teach the other group. The study concluded that the group that received digital game-based instruction learned the concepts better, and their motivation was higher than the other group (Papestergio, 2009).

The results show that students consider educational digital games in lessons as one of the new generationsof teaching materials that enrich the learning experience, arouse excitement and curiosity, support socialization, and make lessons enjoyable. Students emphasize that educational digital games are effective materials that facilitate their understanding of abstract subjects, develop their imaginations, and reinforce newly learned subjects. Students enjoy playing a new educational game and believe that they can solve a problem that occurs in the game.

On the other hand, students think that digital games may cause health problems; they refrain from learning a new subject with this method and are afraid of having problems during the game.

It is concluded that educational digital games offer exciting and creative ways to learn and help establish connections between courses. Students expressed that educational digital games, which they think improve their imagination, should be included in the lessons. The limitations of this study are the administration of the scale in a region far from a city center, with insufficient technological infrastructure and frequent internet access problems, and the sample was limited to middle school students.

SUGGESTIONS

Suggestions made in line with the results obtained in the research are below:

- The use of educational digital games in education, seen as new generation educational materials, can be increased by considering the benefits, such as increasing students' motivation towards the lesson and making learning permanent and enjoyable.
- Many sites on the Internet provide game development opportunities for free. In addition, ready-made games that are suitable for gains can also be preferred.,

- Creating an educational game for each gain in the curriculum may pose a time problem for the teacher. At this point, teachers may revise the content of existing games and add them to the lesson, or may design educational games suitable for many gains.
- Adding educational digital games that summarize and evaluate all gains at the end of the unit will also support concepts such as classroom solidarity, learning together, and peer teaching.
- Assigning educational digital game design projects on specific topics to students and showing how to use technology for positive purposes is recommended.

Author Contributions:

The first author wrote the introduction and conclusion discussion section and collected data. The second author performed data analysis and wrote the Methods and Findings. The last author supervised. The authors contributed equally to the study.

Institutional Review Board Statement:

This study was carried out with the ethics committee document dated and numbered 192 received from Erciyes University, Social and Human Sciences ethics committee.

Conflict Declaration

There is no conflict between the authors.

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