The Use of Digital Educational Games as Learning Media: A Study on Elementary School Teachers

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A R T I C L E   I N F O

A B S T R A K

Game edukasi merupakan salah satu media pembelajaran yang dapat membantu proses belajar siswa, kususnya di era digital seperti saat ini. Adapun tujuan dari penelitian ini yakni untuk menganalisis penggunaan game edukasi digital sebagai media pembelajaran oleh guru sekolah dasar. Penelitian ini merupakan penelitian deskriptif dengan metode survey. Populasi dalam penelitian ini yakni 4315 orang guru Sekolah Dasar. Penarikan sampel dilakukan dengan teknik cluster sampling dan random sampling, sehingga didapatkan jumlah sampel dalam penelitian ini yakni sebanyak 98 orang guru. Data penelitian ini dikumpulkan dengan kuesioner, yang kemudian di analisis secara deskriptif. Berdasarkan penelitian yang telah dilakukan, didapatkan hasil bahwa guru sekolah sudah cukup sering menggunakan game edukasi digital sebagai media pembelajaran, yakni sebanyak 52 guru (53.06%) dari total 98 sampel berada pada ketegori cukup. Aplikasi game edukasi digital yang paling banyak digunakan adalah Quizziz. Alasan penggunaan game edukasi digital yang utama yaitu game edukasi digital dapat meningkatkan kognitif siswa. Keuntungan utama yang dirasakan dalam penggunaan game edukasi sebagai media dalam pembelajaran yaitu membuat proses belajar menjadi lebih efisien. Kendala utama yang dialami yaitu berkaitan dengan internet yang tidak mendukung dan juga aplikasi game edukasi digital yang kerap mengalami error sehingga harus mengulang dari awal. Disimpulkan bahwa guru sekolah dasar sudah cukup sering menggunakan game edukasi digital sebagai media pembelajaran.

A B S T R A C T

Educational games are one of the learning media that can help the student learning process, especially in the digital era as it is today. This study analyzes elementary school teachers' use of digital educational games as learning media. This research is descriptive research with a survey method. The population in this study is 4315 elementary school teachers. Sampling was carried out using cluster sampling and random sampling techniques so that the number of samples in this study was 98 teachers. The research data were collected using a questionnaire, which was then analyzed descriptively. Based on the research that has been done, the results show that school teachers use digital educational games quite often as learning media: 52 teachers (53.06%) of a total of 98 samples are in the sufficient category. The most widely used digital educational game application is Quizziz. The main reason for using digital educational games is that digital educational games can improve students' cognitive abilities. The main advantage of using educational games as a learning medium is making the learning process more efficient. The main obstacles experienced were related to the internet, which did not support it, and digital educational game applications, which often experienced errors. Hence, they had to start over from the beginning. It was concluded that elementary school teachers often used digital educational games as learning media.

1. INTRODUCTION

The development of technology today has affected all aspects of human life, including education. Along with the development of these technologies, the world of education must continue to innovate in teaching (Mukhlison et al., 2021; Utami et al., 2021). One way is to integrate technology into every lesson that is done. Technology can be a learning medium to direct students in achieving learning goals (Bare et al., 2022; Fujiati & Rahayu, 2019). In this regard, teachers have a very important role. Learning media is where they must always keep abreast of technological developments, which is what students need to increase motivation in learning (Bare et al., 2022; Rozie, 2018). Appropriate learning media will assist teachers in conveying learning messages and being faster and more easily captured by students (Lestari et al., 2020; Wicaksana & Atmadja, 2020). The media has a positive power to change students' attitudes and behavior toward creative and dynamic changes. Media is no longer seen as just a tool but as an integral part of the education and learning system (Nurhikmayati & Sunendar, 2020; Sakdah et al., 2021; Wicaksana & Atmadja, 2020).

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Learning media is anything that is used to convey messages and can stimulate the thoughts, feelings, concerns, and willingness of the learner so that it can encourage a deliberate, purposeful, and controlled learning process (Abidin et al., 2021; Windawati & Koeswanti, 2021). In the current situation, learning media is one of the breakthroughs in optimizing classroom learning. The right media and assisted with the right method will make it easier for students to accept the material given by the teacher. Learning media must be made according to needs (Mei & Surat, 2021; Syahbani et al., 2019). These needs are adjusted to the situation of students in the class, the material to be taught, and the existing facilities. One of the learning media that can attract interest and provide motivation is learning media that uses games or games, in the sense that learning is done while playing (Abidin et al., 2021; Bare et al., 2022). Games can positively impact students' academic development if used in the learning process through educational games (Borman & Erma, 2018; Utami et al., 2021).

It's just that reality shows that not all teachers can apply educational game media properly and maximally. It is due to the need for more facilities and infrastructure supporting these educational games. In the learning process, educational games are a media that is very popular with students. It is because educational games can act as a link between education and entertainment that have content and focus on student learning activities (Arifin, 2021; Dewi & Listiowarni, 2019; Faisal, Zuriyati, & Leiliyanti, 2019). Availability of applications in the form of games as learning media that are interesting, easy to use, and useful for improving student learning outcomes. The use of educational games in the learning process will be able to develop positive feelings in students. It is related to the characteristics of elementary school students who like new things, especially technology-related ones (Arifin, 2021; Hendrawan & Marlina, 2022). Furthermore, educational game media can be an alternative to reduce teacher-centered learning. In addition, teachers rely on more than teaching handbooks. Educational games can be played on various digital devices, such as computers and mobile phones (Dewi & Listiowarni, 2019; Faisal et al., 2019).

Several previous studies have revealed that educational games can help teachers attract students' interest in learning by combining interesting audio and visuals (Fujiati & Rahayu, 2019; Pardede & Sunarto, 2020). The results of other studies reveal that in language lessons, such as English lessons, educational games can attract students' interest and help students improve their abilities, such as listening, speaking, reading, and writing (Dewi & Listiowarni, 2019). The results of further research revealed that the use of this educational game could also increase student enthusiasm in increasing the ability to use technology and make positive use of the internet so that students become accustomed to using technology in learning (Abidin et al., 2021; Putri & Asrori, 2019). Based on some of the results of these studies, educational games positively influence student learning outcomes and enthusiasm. It's just that in previous research, there has been no study that specifically discusses the analysis of the use of educational games in learning in elementary schools, especially in Buleleng Regency, such as how often teachers use educational games, what types of games used, the reasons teachers use these games, advantages, and constraints felt by teachers when using digital educational games as learning media. So this research is focused on this study to analyze the use of digital educational games as learning media by elementary school teachers.

2. METHOD

This research belongs to the type of descriptive research with a survey method. In this study, the population was grouped by district, with the number of elementary school teachers in Buleleng Regency in 2021-2022 being as many as 4315 people. The sampling technique used is multistage sampling. The first stage is cluster sampling, taking samples in sub-district clusters. Furthermore, in the second stage, random sampling was carried out by taking samples as respondents from each sub-district. The number of samples in each district can be seen in Table 1.

Table 1. Research Sample

No	Subdistrict	Number of Teachers
1	Gerokgak	9
2	Seririt	10
3	Busungbiu	8
4	Banjar	11
5	Sukasada	13
6	Buleleng	20
7	Sawan	10
8	Kubutambahan	9
9	Tejakula	8
	Total	**98**

Data collection in this study used a questionnaire or questionnaire with the research instrument in the form of a questionnaire using educational game media. The research instrument grid can be seen in Table 2.

Table 2. Research Instruments

No	Aspect	Indicator	
1	Usage Intensity	1.	Every Meeting
		2.	Several Meetings
		3.	Once a week
		4.	Once a month
		5.	Never (reason)
		6.	Others
2	Game Type	1.	Self-developed (State the name)
		2.	Existing
		3.	Duolingo
		4.	Kahoots!
		5.	Seesaw
		6.	Quizlet
		7.	Quizziz
		8.	Padlets
		9.	Others
3	Reasons for Use	1.	Develop students' cognitive
		2.	Easier to use
		3.	Provoke students' interest in learning
		4.	Make it easier to understand the concept of subjects
		5.	Avoid student boredom in learning
		6.	Increase student learning motivation
		7.	Increase student learning curiosity
		8.	Provide a comfortable situation in learning
		9.	Other reasons
4	Advantages of Use	1.	Two-way communication occurs
		2.	Visual elements (can be seen), audio (can be heard), and motion (can interact) stimulate reactions to the teacher's explanation
		3.	Allows students to touch the object of study of the lesson
		4.	Help students concretize something abstract
		5.	More efficient in the teaching-learning process
		6.	The learning process becomes more interesting
		7.	Other reasons
5	Usage Constraints	1.	An error application has occurred
		2.	There needs to be adequate internet support regarding educational games.
		3.	The device does not support the use of educational games
		4.	Lack of knowledge regarding educational games
		5.	Other reasons

Descriptive statistics then analyzed the data obtained in the study. Descriptive analysis aims to describe the research subject and is not intended for hypothesis testing. This descriptive analysis will be assisted by using SPSS 26. Descriptive statistics organize, display, and describe data using tables, graphs, and summary measures. The descriptive analysis provides data in the form of measurement of central tendency (mean) and measurement of dispersion (standard deviation) of the collected research data.

3. RESULT AND DISCUSSION

Result

The data used in this study results from a questionnaire or questionnaire in the form of a Google Form distributed to elementary school teachers in Buleleng Regency. In this study, as many as 98 elementary school teachers became the research sample. The teachers who were the respondents in this study had different teaching periods, starting from 7 months to 39 years. This analysis aims to obtain

information regarding using digital educational games as learning media in elementary schools in the Buleleng Regency. The data obtained from the 98 respondents were then analyzed using SPSS 26 and presented as descriptive statistics. The analysis looks for descriptive statistics, the mean, standard deviation, ideal score, and percentage. The results of the analysis obtained are as follows. Data derived from questionnaires that have been distributed are then analyzed descriptively to see the average value, standard deviation, ideal score, and also the percentage of the use of digital educational games as learning media in elementary schools. The data was then analyzed with the help of SPSS 26.

The results of the research analysis show several findings in this study. The first finding relates to the intensity of the use of educational games by elementary school teachers as their learning media. This aspect consists of four statements related to the intensity of using educational games. The results of the data analysis can be seen in Table 3.

Table 3. Results of Descriptive Statistical Analysis

Statistics Use of Educational Games		
N	Valid	98
	Missing	0
Mean		78.63
Median		79.00
Mode		80
Std. Deviation		6.819
Variance		46.503
Minimum		58
Maximum		99

The data in Table 3 shows the results of data analysis related to the use of digital educational games as learning media in elementary schools. The minimum (lowest) score is 58, the maximum (highest) score is 99, and the mean (mean) is 78.63. The standard deviation is 6.81. Then, the mean data obtained is classified into five categories: good, good, medium, low, and very low. Based on the above calculations, the score category of each statement can be seen in Table 4.

Table 4. Categories of Use of Educational Games

No	Criteria	Category	Frequency	Percentage
1.	X > 88.85	Very frequently	2	2.04
2.	82.03 < X ≤ 88.84	frequently	20	20.41
3.	75.22 < X ≤ 82.03	Enough	52	53.06
4.	68.41 < X ≤ 75.22	Infrequently	14	14.29
5.	X ≤ 68.41	Very rarely	10	10.20
	Total		**98**	**100**

The highest category is sufficient, with 52 teachers (53%) out of 98 samples, and the lowest category is very frequent, with only 2 teachers (2.04%). It shows that most elementary school teachers in Buleleng Regency have used digital educational games as learning media. Digital educational games are used only on certain topics and when they find educational games appropriate to the topics they teach. The second finding relates to the types of digital educational games elementary school teachers use in the Buleleng Regency. The result shows that 39 respondents or 37.10% chose quizziz as a digital educational game they used during learning. Quizis digital educational game is an educational game with the highest percentage of use as a learning medium. Meanwhile, the educational game Quizlet has the lowest usage, with 7.60% or only 8 respondents who use it as a learning medium. Then, 26.70% of respondents, or as many as 28 teachers, used Kahoot as their learning media. It shows that Kahoot is the second most digital educational game after Quizzis. However, 14 respondents, or 13.30% of teachers, were not interested in using digital educational games as their learning media. Furthermore, an analysis was also carried out to find out what types of games were most developed by the teacher.

Regarding the development of digital educational games, as many as 40 respondents, or 38.10%, chose to develop educational games using the quizziz application. As many as 25.70% of respondents, or 27 teachers, chose to develop digital educational games using the Quizzis application. The development of educational games using Quizlet received the lowest response, 7.60%, or only 8 teachers who wanted to

develop educational games using Quizlet. Meanwhile, 12.40% of 13 teachers chose not to develop digital educational games and preferred to use existing digital educational game applications and adapt existing games to their teaching topics. Thus, it can be seen that the digital educational game application used by elementary school teachers in Buleleng Regency is the Quizzis application.

The third finding relates to why teachers use educational games during learning. The analysis results show that elementary school teachers in Buleleng Regency use digital educational games as learning media because they can help teachers develop students' cognitive development.

The fourth finding relates to the advantages of using educational games. The analysis results show that teachers feel the main advantage in using digital educational games as learning media because digital educational games make learning more efficient. Only 42.90% of teachers choose that educational games can make communication between teachers and students more communicative. The second advantage felt by teachers during the use of digital educational games as learning media is that they can stimulate reactions to teacher explanations, visual elements (can be seen), audio (can be heard), and motion (can be interacted). Finally, the third advantage teachers feel is that digital educational games make it easier for students to understand abstract material.

The fifth finding relates to the constraints experienced by teachers when using educational games. The analysis results show that the main obstacle experienced by teachers in using educational games is related to internet support. Then the second obstacle felt by the teacher is that the digital educational games often use experience errors and have to start again from the beginning. The next obstacle is that teachers think that the digital educational games they want to use are often paid, which hinders the use of the digital educational games they want to use in learning. Furthermore, the analysis results also show that teachers find no problems using the device where the device they use supports the digital educational game they want to use. Next, the teachers also stated that the digital educational games they used were able to cover all the topics they taught. Finally, teachers can easily find digital educational games appropriate to their teaching topics.

Discussion

The results of the data analysis show that there are several main findings in this study. The first finding relates to aspects of the intensity of the use of educational games by teachers, which shows that elementary school teachers in Buleleng Regency have used digital educational games quite often as learning media, as many as 52 teachers (53.06%) of total of 98 samples are in the sufficient category. Meanwhile, the very frequent category is 2 teachers (2.04%). Digital educational games are used only on certain topics and when they find educational games appropriate to the topics they teach. The use of digital educational games in the learning process can increase the effectiveness of learning in class and can assist teachers in conveying material more enjoyably, through the use of digital games (Hendrawan & Marlina, 2022; Wijayanto & Istianah, 2017). Communication between teachers and students becomes easier and makes students interested in the material that the teacher brings. It is supported by the statement that learning media in the form of software or hardware can be used as a medium of communication in learning to increase the effectiveness of learning (Mukhlison et al., 2021; Panjaitan et al., 2020).

Regarding selecting media, the research results show that digital educational games will be used if respondents find them appropriate to the material or topic they want to teach. Respondents will adapt digital educational games to the topics they teach. The selection of this digital educational game must consider several factors before it is used in learning so that it can function optimally (Agung & Dewi, 2021; Mulyati & Evendi, 2020). Media use in learning must include learning objectives, student characteristics, and the circumstances and learning environment.

The second finding relates to the type of digital educational game used. The respondents chose Quizziz as the application most often used. Quizziz helps teachers make questions by simply copying and pasting the questions they have made in Word. Students will get scores/points for every student answering a question making it easier to rank. Students will be notified if they answer the wrong question. The questions will differ for each student; at the end, students can review the questions they answered (Haddar & Juliano, 2021; Pratama, 2021). It shows that the Quizziz application is an application that helps respondents in learning. Quizziz is an innovative application that makes it easier for teachers to carry out learning in class because it is easy to use (Mawaddah et al., 2021; Wuriyana & Rosyidi, 2022). Using the quizzes application can train students to be more thorough in answering questions, increase student activity, increase understanding of material independently, and increase student attention in learning (Salsabila et al., 2020; Zhao, 2019). Compared to using the Whatsapp Group, Quizziz can increase students' enthusiasm for learning and train students' cognitive and concentration in answering questions (Salsabila et al., 2020).

The third finding relates to the reasons for using digital educational games. The results of the study show that the reason teachers use digital educational games is that digital educational games can develop students' cognitive development. Using educational games also makes it easier for students to understand the learning material provided and fosters student interest in learning (Alfaris & Suryanti, 2018; Perdana et al., 2020). Educational games also help students understand learning concepts, make students more motivated, increase curiosity, and also place students in a comfortable learning situation. Learning that uses games as a basis for learning will be more interesting for students and can lead students to achievement because they will gain learning experience to overcome challenges in achieving a winning position (Fujiati & Rahayu, 2019; Putri & Asrori, 2019). This game-based learning makes material or technology more interesting by encouraging users to be involved in the desired behavior, thereby increasing audience participation, motivation, and achievement (Perdana et al., 2020). In addition, game-based learning provides a richer experience for process knowledge construction, encourages appreciation of multiple perspectives, embeds realistic and context-relevant learning, and triggers self-awareness of the knowledge construction process (Perdana et al., 2020).

The fourth finding relates to the advantages of using educational games in learning. Educational games as learning media have several advantages, such as making students more interested because of the visual, audio, and motion elements in them. Combining visuals, audio, and motion in educational games can make students more interested and motivated in learning (Alfaris & Suryanti, 2018; Perdana et al., 2020). Educational games combine attractive graphics, various animations, text, audio, and video that can stimulate children's interest in receiving the subject matter presented (Hidayatulloh et al., 2020; Putri & Asrori, 2019). Through educational games, children can directly see, hear, observe, and even interact by navigating through the program's buttons, tools, and other navigations (Bare et al., 2022; Widoretno et al., 2021). In addition, using this educational game provides an opportunity for teachers to help students understand abstract things more easily, then this causes the learning process to become more efficient. Using digital games in learning also aims to help students understand abstract concepts and symbolic language from difficult subjects (Hendrawan & Marlina, 2022; Yulianti & Ekohariadi, 2020).

The fifth finding relates to aspects of the constraints experienced by respondents in using digital educational games in their learning, which are related to inadequate support from the internet. In addition, often, the digital educational game application they use experiences an error or error, and they have to start again from the beginning. Several respondents stated that many educational games they want to use are paid for. These things become obstacles that the respondents feel in using digital educational games. Learning that uses educational games as learning media requires full support from the technology used and a supportive network (Bare et al., 2022; Salsabila et al., 2020; Yulianti & Ekohariadi, 2020). The results of his research show that many applications are different from the specifications of the technology media owned by students, so students experience difficulties in using these applications, such as applications that cannot be opened and closed by themselves. In applying educational games as learning media, students often experience problems with their internet network (Hendrawan & Marlina, 2022). So students need more time to be able to access the application.

The results obtained in this study are in line with the results of research that has been done before, where the application of educational games can help teachers attract students' interest in learning because it is combined with interesting audio and visual (Fujiati & Rahayu, 2019; Pardede & Sunarto, 2020). The results of other studies reveal that in language lessons, such as English lessons, educational games can attract students' interest and help students improve their abilities, such as listening, speaking, reading, and writing (Dewi & Listiowarni, 2019). The results of further research revealed that the use of this educational game could also increase student enthusiasm in increasing the ability to use technology and make positive use of the internet so that students become accustomed to using technology in learning (Abidin et al., 2021; Putri & Asrori, 2019). Based on some of the results of these studies, educational games positively influence student learning outcomes and enthusiasm, so they are feasible for sustainable use.

4. CONCLUSION

Based on the previously described discussion results, it can be concluded that this research is that elementary school teachers in Buleleng Regency often use digital educational games as learning media. The most widely used digital educational game application is Quizziz. The main reason for using digital educational games is that digital educational games can improve students' cognitive abilities.

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