Al-Ishlah: Jurnal Pendidikan
Vol.17, 1 (March, 2025), pp. 1224-1235
ISSN: 2087-9490 EISSN: 2597-940X, DOI: 10.35445/alishlah.v17i1.6140

Understanding Primary School Students' Engagement with Mobile-Based Games: Insights into Learning Implications

Ulfa Khoirotul Rosidah[1], Supartinah[2], Sekar Purbarini Kawuryan[3]

[1] Universitas Negeri Yogyakarta, Yogyakarta, Indonesia; ulfakhoirotul.2022@student.uny.ac.id
[2] Universitas Negeri Yogyakarta, Yogyakarta, Indonesia; supartinah@uny.ac.id
[3] Universitas Negeri Yogyakarta, Yogyakarta, Indonesia; sekarpurbarini@uny.ac.id

ARTICLE INFO

Keywords:

Mobile-Based Games;
Primary School Students;
Game-Based Learning;
Learning Outcomes

Article history:

Received 2024-10-09
Revised 2025-01-06
Accepted 2025-03-17

ABSTRACT

Mobile-based games have become integral to children's daily lives, particularly among primary school students, serving not only as entertainment but also as potential learning tools. This study aims to identify the types of mobile-based games frequently played by primary students and analyze their contribution to learning outcomes. A descriptive quantitative approach was employed, involving 69 fourth-grade students from three primary schools. Data were collected through questionnaires and interviews to capture students' gaming habits and perceptions of their learning experiences. The findings reveal that all participants (100%) have engaged with mobile-based games, with 52 different game types recorded. Action (77%) and adventure (36%) categories emerged as the most popular. Notably, 86% of students reported playing games related to school subjects. These educational games were found to enhance student engagement, foster creativity, and make learning more enjoyable. Specifically, 55% of students rated learning through games as enjoyable, while 42% considered it somewhat enjoyable. The study demonstrates the significant role mobile-based games play in supporting learning, indicating their potential to complement traditional teaching methods. However, the study is limited to a small sample size and specific grade level, suggesting the need for broader research. Future studies should explore the development of structured game-based learning frameworks and encourage collaboration between educators and game developers to design effective educational tools tailored to students' interests.

Corresponding Author:
Ulfa Khoirotul Rosidah
Universitas Negeri Yogyakarta, Yogyakarta, Indonesia; ulfakhoirotul.2022@student.uny.ac.id

1. INTRODUCTION

Digital transformation has become one of the most pressing issues in the context of education (Iivari et al., 2020). The introduction of digital technologies not only provides new opportunities for learning but also changes the pedagogical approach to teaching and learning (Deepika et al., 2021). Therefore, it is essential to investigate how these technologies, when integrated into learning activities, affect teaching and learning processes (Antonietti et al., 2023).

One of the most popular forms of digital technology among children and teenagers is mobile-based games. These games, initially designed for entertainment, have also been recognized as tools for enhancing the teaching and learning process. The rapid development of games can have both positive and negative impacts (Legowo et al., 2023). Studies indicate that educational games create engaging learning environments (Hamidah et al., 2023; Sutmo et al., 2023), improve outcomes such as learning achievement (Wardani & Kiptiyah, 2024; Kurniawan et al., 2022), critical thinking skills (Fitriyadi & Wuryandani, 2021), and student activeness (Nurhayati, 2020). Proper integration of games into educational contexts can significantly improve learning quality and contribute to achieving educational goals by developing high-quality individuals (Anggraini, 2023; Fatmawati, 2016).

The negative impact of mobile-based games played online is stated in various studies. These negative impacts include impaired social and emotional skills (Ramadhan & Ramadan, 2023; Hou et al., 2022), impaired health (Hasan et al., 2024; Ramadhan & Ramadan, 2023), reduced politeness of speech (Ramadhan & Ramadan, 2023; Prasetyo et al., 2023), decreased learning achievement (Prasetyo et al., 2023), and decreased student learning motivation (Iskandar, et al., 2019).

Although the potential of digital games as educational tools had been recognized in various studies, more research needs to be done that explicitly examines the types of mobile-based games and students' experiences of gaming at the primary level. Most previous studies have focused on one type of mobile-based game and its impact on students (Rosyad & Hidayanto, 2024; Febriady et al., 2022). Previous research has identified the types of games elementary school students play in general (Legowo et al., 2020). However, only some have explored the types of mobile-based games that are frequently played by students, especially among primary school students, and how they utilize these games to support their daily learning process. This research gap indicates a need for an in-depth understanding of students' preferences in the use of mobile-based games in their daily lives. This study aims to fill this gap by identifying the types of mobile-based games that are often played by fourth-grade elementary school students and finding out students' experiences playing games with learning material content.

Through the descriptive quantitative method, this study explores objective data regarding the experiences of fourth-grade elementary school students in playing mobile-based games. Data collection was conducted through the distribution of questionnaires and interviews, aiming to obtain comprehensive information. The data collected is expected to provide important insights into students' habits in playing mobile-based games, which can later be used as a basis for identifying students' needs in the learning process.

In addition, this research also focuses on how mobile-based games can affect students' enjoyment of learning. Through the analysis of the data generated, patterns of student behavior and preferences related to the games they play, especially those related to the potential of games as learning media, are expected to be found. The results of this research are expected to be the basis for the development of more effective and engaging learning strategies by utilizing digital technology that is increasingly close to students' daily lives.

2. METHODS

This research uses a quantitative descriptive approach to describe phenomena objectively through numerical data analysis (Legowo et al., 2020; Isnawati et al., 2020). The main focus of this study was to describe students' experiences playing mobile-based games and their preferences for the types of games that are frequently played. A quantitative descriptive approach was chosen because it was appropriate to broadly describe students' experiences with mobile-based games and their preferences for frequently played games. In addition, this approach allowed for analysis of data in the form of frequency distributions and percentages, which facilitated the understanding of general trends in students' experiences. The research procedure is described below.

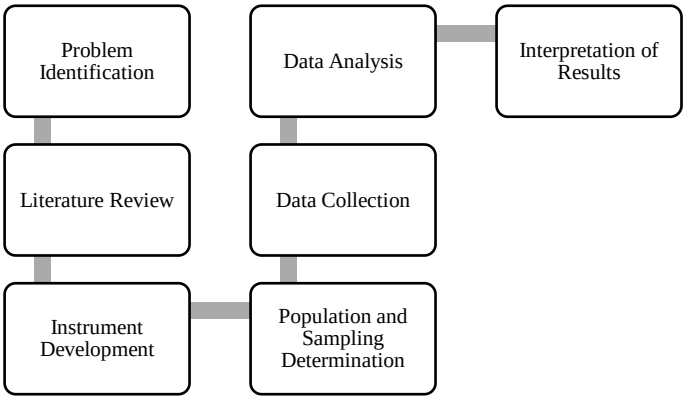

Figure 1. The research procedure adopted from Legowo et al. (2020)

2.1 Participants

The research sample consisted of three elementary schools in Sleman Regency, the Yogyakarta Special Region. These schools are SD Negeri Corongan, located in a rural area, and SD Negeri Adisucipto 1 and SD Negeri Adisucipto 2, located in a suburban area. From a total of seven elementary schools in Depok District, three schools were purposively selected based on specific criteria relevant to the research objectives. These criteria included the schools' geographical location and their accessibility for data collection. The selection of these schools is expected to provide a representative picture of the differences in characteristics between students in rural and suburban areas. Sampling was conducted using the purposive sampling technique, which allows the selection of research subjects based on specific criteria relevant to the research objectives. This study was conducted in February, July, and August 2024. This study involved 69 fourth-grade elementary school consideration that grade IV is a transitional stage from low to high grades, so students at this level are considered capable of representing the characteristics of the two grade groups.

Additionally, purposive sampling, while suitable for achieving the research goals, introduces an inherent bias because it does not ensure that the sample is fully representative of the broader population. This limitation may affect the external validity of the findings, particularly in generalizing the results to other contexts. To mitigate this bias, the selected schools were chosen to reflect a range of student backgrounds in both rural and suburban areas. However, it is important to interpret the findings within the scope of this limitation.

2.2 Instruments

The data in this study was collected through survey and interview methods. The survey method was chosen as it effectively identifies many students' gaming experiences and preferences in a short period. The survey instrument used was a semi-open-ended questionnaire consisting of closed-ended and open-ended questions. The use of open-ended questions aims to get a deeper explanation of students' experiences playing mobile-based games that cannot be explained in detail through closed questions.

Table 1. Research Questionnaire Grid

No	Aspect	Questions Type
1	Student experience playing mobile-based games	Closed questions
2	Mobile-based games that students often play	Open questions
3	Students' experience of playing learning material games at school and or at home	Closed questions
4	Students' opinions about learning through games	Closed questions

In addition, semi-structured interviews were used to deepen the understanding of the survey responses. These interviews were conducted with selected students to dig deeper into the reasons behind their preferences for certain types of games and their learning experiences using games. The data from these interviews aimed to strengthen and clarify the quantitative data obtained through the survey.

Three educational expert validators have validated the instruments used in this study through construct validity. The assessment results from the three validators were calculated using the Aiken scale (Retnawati, 2016). The experts evaluated each item on a 4-point Likert scale, ranging from 1 (not relevant) to 4 (highly relevant). The content validity coefficient based on expert assessment is 0.89, indicating high validity (An Nabil et al., 2022; Utami et al., 2024). The reliability coefficient of the survey instrument obtained a value of 0.75, which is included in the sufficient category and can be relied upon to measure the variables studied.

2.3 Data Collection Prosedur

Data was collected through a survey distributed to students during a school visit. The survey, in the form of a printed questionnaire, was administered to students in a classroom setting, ensuring they had ample time to complete it. Verbal explanations regarding the completion of student surveys will not affect students' grades or learning achievements in class and are used to avoid social desirability bias. After the students had filled out the questionnaires, the researcher collected them to ensure completeness. Furthermore, six students with male and female gender criteria were selected for face-to-face interviews. These interviews were conducted in a conducive setting, allowing the students to elaborate on their answers while ensuring confidentiality.

2.4 Data Analysis

The questionnaire data was analyzed using descriptive statistical analysis. The results of the closed-ended responses were analyzed based on frequency distributions and percentages using SPSS 26 to describe the general pattern of students' experiences regarding the use of mobile-based games. The open-ended responses were analyzed through thematic analysis. This analysis aimed to identify key themes related to students' gaming preferences, namely action, adventure, education, simulation, sports, and others. The game-type grouping results were also analyzed based on the frequency distribution and percentage using SPSS 26. Interview data was analyzed qualitatively using simple thematic analysis techniques. This analysis clarified and supported the survey results. Students' answers were grouped by theme according to the survey questions. All data obtained in this study was kept anonymous and confidential. The recording method was used for the interviews. The interviews were analyzed through a coding process.

3. FINDINGS AND DISCUSSION

3.1 Findings

The results of this study present two main findings: students' experience playing mobile-based games and the types of games played, students' experience playing games containing learning materials, and students' enjoyment of learning through games.

3.1.1 Students' Experience Playing Mobile-Based Games and Types of Games Played

The results of analyzing student questionnaires obtained data that 69 students have played mobile-based games. The types of games played by students were recorded at least 52 types of games. The student data, along with the types of games that are often played, can be seen in Figure 2 as follows.

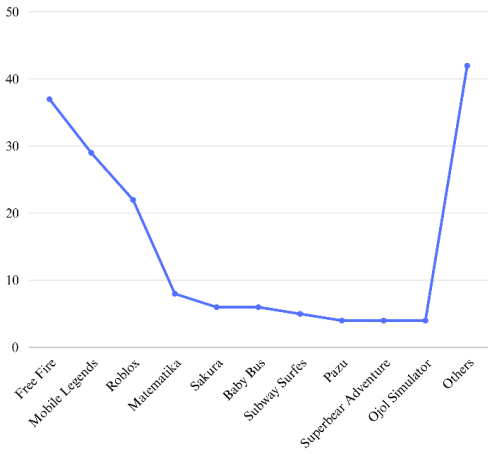

Figure 2. Identification of types of games that are often played by students

The data in the graph shows the types of mobile-based games that students often play. The graph shows that Free Fire, Mobile Legends, and Roblox are the most popular games among students. Students who often play these games are more than 20 students. Meanwhile, other types of games are less popular among students. These findings reflect the diversity of students' preferences for mobile games and the tendency to try different games that suit their interests.

The types of games that students often play are categorized into five categories: actions, adventures, education, simulations, sports, and others. The categories of the types of games that students often play are presented as follows.

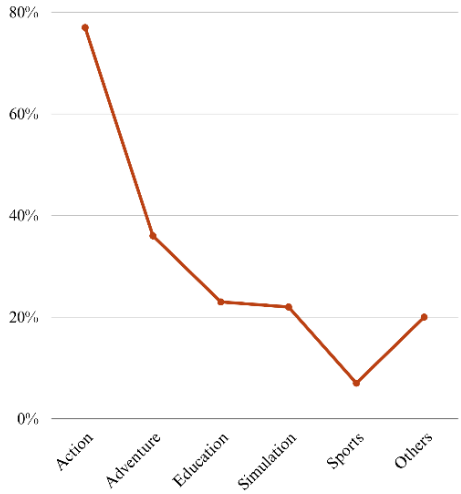

Figure 3. Categories of games that students often play

The graph shows that the Action game category is most frequently played by students, with a percentage of almost 80% of students. Adventure games came in second, although much lower than Action. Students also play Education and Simulation games, showing a lower interest in these categories. This data suggests that students are more interested in games that offer Action and adventure than educational or simulation games. The qualitative data from the student interviews provided valuable insights into their preferences for action and adventure games. Many students expressed a preference for action and adventure games for the excitement they offer. One student said the reason for playing action games, “because it's exciting and fun” (S1/M/SC3).

The research findings show that students tend to play Action and Adventure games. Only 22% of students mentioned that they prefer games with educational content. These findings suggest that,

although some students are interested in games that can develop cognitive skills, most still play for entertainment and fun.

The analysis of students' game preferences showed a consistent pattern across different demographics, with both rural and suburban students, as well as male and female participants, tending to favor action-based games. This preference stems from the excitement and challenges offered by action elements, such as time-based tasks, rewards, and missions. The findings indicate that incorporating action elements into educational games can appeal to a wide range of students, regardless of their background or gender. This suggests that integrating engaging challenges and interactive tasks in game design is essential to maintaining students' interest and motivation in learning.

Interestingly, female students were more dominant in playing educational games than male students. In addition, female students also showed more varied preferences in the types of games played, including a combination of educational games with other genres such as adventure and puzzle. This suggests that female students tend to have a broader interest in different types of games that can combine entertainment and learning, while male students are more focused on specific genres. This finding can be an important consideration for educational game developers when creating engaging content that meets the needs of diverse student groups.

3.1.2 Students' Experience of Playing Games with Learning Materials and Students' Enjoyment of Learning Through Games

The results of the data analysis related to students' experience playing games with learning materials obtained data that 59 students stated that they had played games related to subject matter at school or at home. The results of the interview obtained information that several learning contents at school are carried out through games, such as games for learning English. The percentage of students who experience playing games with learning materials is presented in Figure 3 as follows.

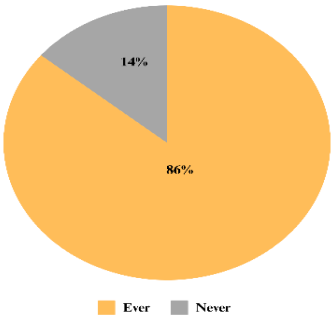

Figure 4. The percentage of students' experience playing games with learning materials

Regarding the fun of learning using games, 38 students stated that learning with games is more fun, 29 stated that it is quite fun, and two stated that it is not fun. The results of the interview revealed that students like learning through games because it is exciting and fun. The percentage of students' enjoyment of learning through games is presented in Figure 4 as follows.

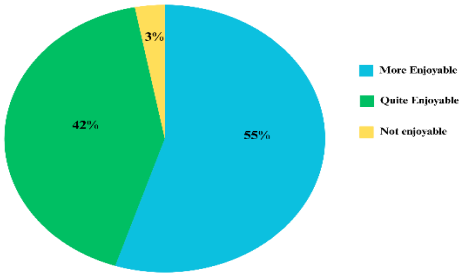

Figure 5. The percentage of students' enjoyment of learning through games

3.2 Discussion

3.2.1 Students' Experience Playing Mobile-Based Games and the Types of Games Played

The results showed that the entire sample of 69 students had played mobile-based games. The characteristics of elementary school children show that they really like the world of play. Children at this age tend to like to explore, play, and have great curiosity (Primaestri et al., 2023; Djaali, 2015). Generally, elementary school children aged 7-12 years often play games, including online games on smartphones or other devices, with the majority of games played being Android-based (Febriady et al., 2022; Legowo et al., 2020).

Based on 52 types of games that are often played by students, there are three most popular games, namely Free Fire, Mobile Legends, and Roblox. These three games are mobile-based games that are played online (Legowo et al., 2020). This finding shows the high interest of students in games that offer real-time interaction and direct competition with other players.

From the results of the study, the order of game categories that students are most interested in is action, adventure, education, simulation, and sports, which reflects their inclination towards games that provide challenges, learning, and immersive virtual experiences. This finding is in line with studies that address action games in an educational context such as Mobile Legends (Rosyad & Hidayanto, 2024; Qothrunnada et al., 2024; Rochmayanti, 2021; Dananjaya & Kusumastuti, 2019) and Free Fire (Kurnia et al., 2024; Novrita et al., 2023; Febriady et al., 2022; Harahap & Ramadan, 2021).

However, the results also show that mobile-based educational games are still not the leading choice for students when it comes to playing activities. This finding needs serious attention in an effort to maximize the potential of games as a more exciting and effective learning tool. Games are the most suitable alternative learning media for students, supported by more than 50% of students who choose them compared to movies, videos, or comic books (Christian & Prasida, 2018).

Previous research shows a relationship between the use of online games and student learning motivation. Research by Saputra et al. (2024) highlighted that stimulation and action games reduce students' learning motivation compared to educational and simulation games. In addition, research by Iskandar et al. (2019) also showed that the decline in students' learning motivation was caused by the high intensity of playing action games. This finding emphasizes the importance of paying attention to the daily student interest in action games. Although few students specifically mentioned playing educational games, there are still opportunities to develop educational games that remain engaging and relevant to students.

3.2.2 Students' Experience of Playing Games with Learning Materials and Students' Enjoyment of Learning Through Games

The results showed that the majority of students had played games with learning materials. This study shows that the influence of technology in the digital era has an impact on the need for technology in learning that teachers can optimize. Technology integration in education is a necessity to improve the quality of learning (Kariyati et al., 2024). The development of digital technology encourages the application of learning methods that are interesting and to student needs and requires educators to utilize it as a positive learning medium (Eliana et al., 2024; Setiawan et al., 2020). The rapid development of web technology and digital devices facilitates the use of digital games in education (Zhan et al., 2022). Increasingly sophisticated technology not only expands the gaming industry but also encourages teachers to be more creative in designing learning processes that utilize digital games (Kristriani & Usodo, 2022; Putu et al., 2023).

The results also show that the majority of students enjoy learning through games. Students' natural interest and curiosity in games make games one of the interactive media that can be utilized by teachers (Liu et al., 2023). Game-based learning is one of the alternatives to create exciting learning (Susanti et al., 2022).

This study underlines that the majority of students like learning by using games as the media. The findings of this study are the results of previous studies that show the relationship between the use of educational games and students' learning enthusiasm. Digital game-based learning increases students' enthusiasm in the learning process and shows that this method is more fun than conventional learning (Hamidah et al., 2023; Hwa, 2018; Ding et al., 2017). Even the proper use of games in learning not only motivates students but is also beneficial in developing students' concentration. Using games as learning media contributes positively to improving the ability to focus and think critically towards problem-solving (Rakimahwati et al., 2022; Rochimah & Muslim, 2021).

Based on the findings, this study aligns with several previous research findings. Research by Legowo et al. (2023) mentioned that most students are interested in playing Android-based games. As in this study, all student samples mentioned having played games using mobile devices. Research by Setiawan & Widearti (2020) shows that the use of application-based games increases student enthusiasm for learning. Likewise, this study's findings show that students enjoy learning through games.

The findings of this study add a new perspective by showing that students' preference for games is not only based on the educational content but also the interactivity and challenge elements that games offer. As such, this study contributes to the existing literature by offering a deeper understanding of how games can be integrated into the learning process, as well as showing that students' preferences for educational games can be optimized by considering more appealing aspects. Thus, if developers can create educational games that are fun and engaging, then students will not only enjoy the learning process but will also increase their motivation to learn optimally. Therefore, the integration of games in learning can pay attention to the suitability of the type of game, the aspect of game attractiveness according to student characteristics, and the learning objectives to be achieved. Students' experience playing games with learning materials can maximize their learning potential and create a more effective and enjoyable learning experience.

Several educational games have demonstrated success in engaging students by incorporating interactive and immersive elements. For example, WordWall is a game-based interactive learning media (Rosidah et al., 2024), while Minecraft: Education Edition promotes creativity and problem-solving through open-world exploration aligned with educational objectives (Wierik, 2022). Similarly, Kahoot! engages students through competitive quizzes that reinforce learning in a fun, interactive format (Plump & LaRosa, 2017; Natarajan et al., 2023). These examples highlight the importance of integrating engaging game mechanics, such as storytelling, challenges, and real-time feedback, which are also reflected in this study's findings.

Despite its numerous benefits, game-based learning presents several challenges that educators and developers must address to ensure its effectiveness. One key limitation is accessibility, particularly for schools with limited technological resources or for students who lack access to devices (Eliana, et al., 2024). To address this issue, developers can create lightweight game applications that require minimal device specifications and offline functionality. Schools can also explore shared device policies to ensure equitable access during learning sessions.

Furthermore, there is a risk of reduced social interaction when students engage in game-based learning individually (Ramadhan & Ramadan, 2023; Hou et al., 2022; Prameswara & Lestari, 2021). To counteract this, educators can incorporate collaborative game-based activities that encourage peer interaction and teamwork. Games designed with multiplayer or cooperative modes can enhance students' communication and problem-solving skills while maintaining the educational purpose of the activity. By proactively addressing these challenges, teachers and developers can maximize the educational potential of game-based learning while minimizing its limitations.

To enhance the engagement and effectiveness of educational games, incorporating elements of action and adventure genres can align with students' preferences while maintaining a focus on learning objectives. Action elements, such as time-based challenges and reward systems, can be integrated to increase motivation and engagement. For example, educational games can incorporate missions or

quests that require students to solve problems within a set time frame, reinforcing critical thinking and time management skills. Adventure game elements can also be used to create immersive learning experiences. Games can include narrative-driven storylines that guide students through various learning scenarios, making abstract concepts more relatable and memorable. For instance, a language learning game could involve students navigating a virtual world where they interact with characters using newly acquired vocabulary, reinforcing language skills in a practical context. By balancing these elements, educational games can effectively meet both students' academic and engagement needs.

This study has limitations, including a sample size of 69 students from three elementary schools, which may not represent the wider population. The focus on mobile-based games and a few specific game types also limited the variety of games studied. Contextual factors such as family environment and teacher support were not explicitly measured, and students' subjectivity in perceived enjoyment and engagement in learning through games may also affect the results. The researcher recommends that future research expand the sample to include more students from different regions for more representative results. Exploration of different types of games and long-term studies are also essential to understand the impact of using games in learning. In addition, adding analysis of contextual variables such as family environment and teacher support would enrich the findings. Developing more in-depth methods to measure student enjoyment and engagement is also recommended.

4. CONCLUSION

This study highlights the significant potential of mobile-based educational games in enriching primary school students' learning experiences. Although action, adventure, and simulation games are the most favored among students, the majority express enjoyment when learning is integrated into gameplay. The findings emphasize that well-designed educational games can effectively enhance student engagement and motivation. Practical applications include incorporating mission-based tasks to reinforce vocabulary acquisition or embedding math challenges within adventure game narratives, making learning both interactive and meaningful. To maximize the benefits, educators are encouraged to leverage existing game platforms or collaborate with developers to design culturally relevant and curriculum-aligned educational games that meet local learning objectives.

However, the study acknowledges several barriers to implementing educational games in schools, including funding constraints, digital access disparities, and the need for teacher training. Addressing these challenges requires a collaborative approach involving key stakeholders such as teachers, school administrators, policymakers, and developers. Teachers play a critical role in integrating games into lesson plans, while school administrators must facilitate digital infrastructure improvements and teacher capacity building. Policymakers are responsible for creating supportive regulations and allocating funding, while developers should ensure the educational relevance and accessibility of the games they create. By overcoming these barriers, educational games have the potential to influence not only primary school education but also broader curriculum designs and extracurricular learning activities, creating a more dynamic, engaging, and inclusive learning environment.

Acknowledgements: I would like to thank Universitas Negeri Yogyakarta for its support as the primary affiliate in this research. I also thank the principal, teachers, and all students involved for their cooperation and valuable contributions throughout the research process. Hopefully, this article can positively contribute to the development of learning methods, especially at the elementary school level, and inspire further research in the field of education.

REFERENCES

Anggraini, W. N. (2023). Increase Interest in Learning Mathematics for 5th Grade Students Using Android Game-Based Learning Media. *International Journal of Elementary Education, 7*(4), 637–645. https://doi.org/10.23887/ijee.v7i4.64937

An Nabil, N. R., Wulandari, I., Yamtinah, S., Ariani, S. R. D., & Ulfa, M. (2022). Analisis indeks aiken untuk mengetahui validitas isi instrumen asesmen kompetensi minimum berbasis konteks sains

kimia. *Paedagogia: Jurnal Penelitian Pendidikan, 25*(2), 184–191. https://doi.org/10.20961/paedagogia.v25i2.64566

Antonietti, C., Schmitz, M. L., Consoli, T., Cattaneo, A., Gonon, P., & Petko, D. (2023). Development and validation of the ICAP Technology Scale to measure how teachers integrate technology into learning activities. *Computers and Education, 192*(October 2022), 104648. https://doi.org/10.1016/j.compedu.2022.104648

Christian, I. V., & Prasida, A. S. (2018). Developing board game as learning media about waste sorting for fourth grade students of elementary school. *Jurnal Prima Edukasia, 6*(1), 78–88. https://doi.org/10.21831/jpe.v6i1.17148

Dananjaya, A., & Kusumastuti, D. (2019). Students' Perception on Online Game Mobile Legends for Vocabulary Development. *ELLITE: Journal of English Language, Literature, and Teaching, 4*(2), 53–58. https://doi.org/10.32528/ellite.v4i2.2626

Deepika, A., Kandakatla, R., Saida, A., & Reddy, V. B. (2021). Implementation of ICAP principles through technology tools: Exploring the alignment between pedagogy and technology. *Journal of Engineering Education Transformations, 34*(Special Issue), 542–549. https://doi.org/10.16920/jeet/2021/v34i0/157210

Ding, D., Guan, C., & Yu, Y. (2017). Game-based learning in tertiary education: a new learning experience for the generation z. *International Journal of Information and Education Technology, 7*(2), 148–152. https://doi.org/10.18178/ijiet.2017.7.2.857.

Djaali, H. (2015). *Psikologi pendidikan*. Jakarta: Bumi Aksara.

Eliana, N., Wati, U. A., & Rahmadona, S. (2024). Leveraging the ASSURE Model Technology-Based Learning Media for Optimized Information. *AL-ISHLAH: Jurnal Pendidikan, 16*(3), 3614–3626. https://doi.org/10.35445/alishlah.v16i3.5639

Fatmawati, L. (2016). Peningkatan keaktifan dan pemahaman konsep IPS melalui model learning cycle 5E. *Jurnal Prima Edukasia, 4*(2), 148-162. https://doi.org/10.21831/jpe.v4i2.9488

Febriady, D., Pebriana, P. H., Alim, M. L., & Ananda, R. (2022). The Impact of free fire online games on students' social behavior at elementary school. *JIP Jurnal Ilmiah PGMI, 8*(2), 140–150. https://doi.org/10.19109/jip.v8i2.14165

Fitriyadi, N., & Wuryandani, W. (2021). Is educational game effective in improving critical thinking skills? *Jurnal Prima Edukasia, 9*(1), 107–117. https://doi.org/10.21831/jpe.v9i1.35475

Hamidah, F., Setiawan, F., & Mirnawati, L. B. (2023). Strenghthening digital literacy of elementary school students through utilization of wordwall as game-based learning interactive media. *Jurnal Ilmiah Sekolah Dasar, 7*(2), 215-223. https://doi.org/10.23887/jisd.v7i2.55807

Harahap, S. H., & Ramadan, Z.H. (2021). Dampak game online free fire pada siswa sekolah dasar. *Jurnal Basicedu, 5*(3), 1304-1311. https://doi.org/10.17509/pedadidaktika.v8i4.41750

Hasan, T., Bonny, M. Z., Das, R. K., Sultana, S., Islam, M. T., & Sattar, A. (2024). Prediction of bangladeshi urban children's mental health for the effect of mobile gaming using machine learning. *International Journal on Advanced Science, Engineering and Information Technology, 14*(3), 859–865. https://doi.org/10.18517/ijaseit.14.3.18534

Hou, C. Y., Rutherford, R., Chang, H., Chang, F. C., Shumei, L., Chiu, C. H., Chen, P. H., Chiang, J. T., Miao, N. F., Chuang, H. Y., & Tseng, C. C. (2022) Children's mobile-gaming preferences, online risks, and mental health. *PLoS ONE, 17*(12), 1–18. https://doi.org/10.1371/journal.pone.0278290

Hwa, S. P. (2018). Pedagogical change in mathematics learning: Harnessing the power of digital game-based learning. *Educational Technology and Society, 21*(4), 259–276.

Iivari, N., Sharma, S., & Ventä-Olkkonen, L. (2020). Digital transformation of everyday life – How COVID-19 pandemic transformed the basic education of the young generation and why information management research should care? *International Journal of Information Management, 55*(June), 102183. https://doi.org/10.1016/j.ijinfomgt.2020.102183

Iskandar, F. R., Hidayat, S., & Ganda, N. (2019). Dampak permainan mobile legend terhadap motivasi belajar siswa sekolah dasar. *EduBasic Journal: Jurnal Pendidikan Dasar, 1*(2), 116–122.

https://doi.org/10.17509/ebj.v1i2.26599
Isnawati, I., Jalinus, N., & Risfendra, R. (2020). Analisis kemampuan pedagogi guru SMK yang sedang mengambil pendidikan profesi guru dengan metode deskriptif kuantitatif dan metode kualitatif. *INVOTEK: Jurnal Inovasi Vokasional dan Teknologi, 20*(1), 37–44. https://doi.org/10.24036/invotek.v20i1.652
Kariyati, A., Ramadhan, S., Mukhaiyar, M., & Ulya, R. H. (2024). Needs analysis of Mandarin language learning assisted by the wordwall game application on students a University in Padang. *AL-ISHLAH: Jurnal Pendidikan, 16*(2), 1597–1605. https://doi.org/10.35445/alishlah.v16i2.4798
Kristriani, T., & Usodo, B. (2022). Exploration of the use of Quizizz gamification application: teacher perspective. *International Journal of Elementary Education, 6*(2), 205–212. https://doi.org/10.23887/ijee.v6i2.43481
Kurnia, R., & Ula, D. M. (2024). Dampak game online free fire bagi perubahan perilaku anak sekolah dasar. *Triwikrama : Jurnal Ilmu Sosial, 3*(12), 101–111.
Kurniawan, Y. I., Yulianti, U. H., Yulianita, N. G., & Pratama, A. P. (2022). English learning educational games for hearing and speech impairment students at SLB B Yakut Purwokerto. *Jurnal Teknik Informatika (JUTIF), 3*(3), 781–790. https://doi.org/10.20884/1.jutif.2022.3.3.317
Legowo, Y. A. S., Puspitasari, N., Shintya, Y., Baligh, L. N. A., & Setiyawan, J. N. (2023). Gamifikasi: identifikasi jenis permainan siswa sekolah dasar. *Jurnal Ilmiah Pendidikan Dasar, 10*(1), 1-11. https://doi.org/10.30659/pendas.10.1.1-11
Liu, T., Oubibi, M., Zhou, Y., & Fute, A. (2023). Research on online teachers' training based on the gamification design: A survey analysis of primary and secondary school teachers. *Heliyon, 9*(4). https://doi.org/10.1016/j.heliyon.2023.e15053
Natarajan, P., Subramanian, S., Amitkumar, K., Joseph, A., & Venugopal, N. (2023). Effectiveness of game-based learning: A cross-sectional study on phase 1 medical students. *National Journal of Clinical Anatomy*, *12*(2), 104–109. https://doi.org/10.4103/NJCA.NJCA_4_23
Novrita, M., Suharma, & Abidah. (2023). The influence of the free fire online game on changes in the social character of students MIN 16 aceh barat. *Proceeding of Dirundeng International Conference on Islamic Studies (DICIS 2023)*, 114–128.
Nurhayati, E. (2020). Meningkatkan keaktifan siswa dalam pembelajaran daring melalui media game edukasi quiziz pada masa pencegahan penyebaran Covid-19. *Jurnal Bahasa Indonesia Prima (BIP), 2*(2), 145-150. https://doi.org/10.34012/bip.v2i2.1729
Plump, C. M., & LaRosa, J. (2017). Using Kahoot! in the classroom to create engagement and active learning: A game-based technology solution for eLearning novices. *Management Teaching Review, 2*(2), 151-158. https://doi.org/10.1177/2379298116689783
Prasetyo, A., Rondli, W. S., & Ermawati, D. (2023). Dampak permainan game online terhadap prestasi belajar siswa sekolah dasar. *Jurnal Educatio FKIP UNMA, 9*(1), 333–340. https://doi.org/10.31949/educatio.v9i1.4733
Primaestri, W., Akhyar, M., & Sutimin, L. A. (2023). Bibliometric analysis of game research trends in elementary learning and self-regulated learning skill. *Jurnal Prima Edukasia, 11*(2), 225–234. https://doi.org/10.21831/jpe.v11i2.60264https://doi.org/10.21831/jpe.v11i2.60264
Putu, I., Putra, A. S., & Paramita, V. A. (2023) The use of digital educational games as learning media: A study on elementary school teachers. *International Journal of Elementary Education, 7*(2), 212–219. https://doi.org/10.23887/ijee.v7i2.58432
Qothrunnada, A. I., Asmiyah, S., Siraj, T., & Hasnawati, L. (2024). The use of mobile legends to facilitate english narrative writing skills development: students' perceptions. *English Education: Jurnal Tadris Bahasa Inggris, 17*(1), 23-35. https://doi.org/10.24042/ee-jtbi.v17i1.21467
Rakimahwati, R., Hanifa, N., & Aryani, N. (2022). Android based educational game development to improve early childhood reading ability. *AL-ISHLAH: Jurnal Pendidikan, 14*(2), 1123–1134. https://doi.org/10.35445/alishlah.v14i2.1053
Ramadhan, N. S., & Ramadan, Z. H. (2023). Analisis dampak negatif kecanduan game online mobile

legend pada siswa. *Murhum: Jurnal Pendidikan Anak Usia Dini, 4*(2), 430–441. https://doi.org/10.37985/murhum.v4i2.343

Retnawati, H. (2016). Proving content validity of self-regulated learning scale (the comparison of Aiken index and expanded Gregory index). *Research and Evaluation in Education, 2*(2), 155–164.

Rochimah, H., & Muslim, S. (2021). Students' perceptions in using the Kahoot! Game on reading comprehension learning. *AL-ISHLAH: Jurnal Pendidikan, 13*(3), 2213–2222. https://doi.org/10.35445/alishlah.v13i3.1115

Rochmayanti, S., Azizah, A. N., Bintang, A., & Pradana, A. (2021). The impact of mobile legends games on student learning motivation : the role of parents and teachers. *The 14th University Research Colloqium*, 1063–1070.

Rosidah, U. K., Wijayanti, W., Mulyani, & Mahendra, Y. (2024). *Increasing teachers' capabilities in developing WordWall interactive learning media through continuous training*. Atlantis Press SARL. https://doi.org/10.2991/978-2-38476-245-3_15

Rosyad, R. S., & Hidayanto, S. (2024). The influence of emotional intelligence on toxic behavior in playing the online game mobile legends. *3*(2), 263–275.

Saputra, A. R., Yunida, F., Hasriani, H., Utami, I. F., & Soleha, S. (2024). Pengaruh game online terhadap motivasi belajar peserta didik di SDN 1 Pringsewu Timur. *Jurnal Pendidikan Guru Sekolah Dasar, 1*(3), 1-8. https://doi.org/10.47134/pgsd.v1i3.287

Setiawati, S., Deswarni, D., & Yunita, W. (2020). Learners' interest in new normal. *AL-ISHLAH: Jurnal Pendidikan, 12*(2), 259–269. https://doi.org/10.35445/alishlah.v12i2.255

Setiawan, M. R., & Wiedarti, P. (2020). The effectiveness of quizlet application towards students' motivation in learning vocabulary. *Studies in English Language and Education, 7*(1), 83–95. https://doi.org/10.24815/siele.v7i1.15359

Susanti, V. D., Suprapto, E., & Wardani, Y. A. (2022). Development of android-based edutainment game learning media on Phytagoras theorem for Junior High School students. *AL-ISHLAH: Jurnal Pendidikan, 14*(3), 3931–3942. https://doi.org/10.35445/alishlah.v14i3.1978

Sutmo, F., Dewanto, B. A., Mucoffa, M. A. M., Kurniawan, Y. I., & Wijayanto, B. (2023). Math runner: game edukasi matematika untuk anak sekolah dasar. *Jurnal Pendidikan dan Teknologi Indonesia, 3*(4), 165–173. https://doi.org/10.52436/1.jpti.286

Taherdoost, H. (2019). What is the best response scale for survey and questionnaire design; Review of different lengths of Rating Scale/Attitude Scale/Likert Scale. International Journal of Academic Research in Management (IJARM), 8(1), 2296–1747.

Utami, L., Festiyed, Ilahi, D. P., Ratih, A., Lazulva, Yenti, E., & Lazulva. (2024). Analisis indeks aiken untuk mengetahui validitas isi instrumen scinetific habbits of mind. *Journal of Research and Education Chemistry, 6*(1), 59–67.

Wardani, M. E., & Kiptiyah, S. M. (2024). Game-based learning model with baamboozle media based on artificial intelligence increases student engagement and learning outcomes. *Jurnal Ilmiah Sekolah Dasar, 8*(2), 293–303. https://doi.org/10.23887/jisd.v8i2.67141

Wierik, H. R. (2022). *Developing a gamification program to motivate users in pre-existing e-learning courses*. *July*. http://essay.utwente.nl/93015/%0Ahttp://essay.utwente.nl/93015/1/TeWierik_BA_EEMCS.pdf

Zhan, Z., He, L., Tong, Y., Liang, X., Guo, S., & Lan, X. (2022). The effectiveness of gamification in programming education: evidence from a meta-analysis. *Computers and Education: Artificial Intelligence, 3* (September). https://doi.org/10.1016/j.caeai.2022.100096