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The use of game-based learning to increase student engagement

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ABSTRACT

The use of game-based learning is an innovative approach to increasing student engagement in the educational environment. This study aims to explore and identify the impact of the realization of a game-based learning method on the level of student engagement. The research method used is a literature study to be able to map research topics broadly by citing sources from the latest scientific journal articles and using Indonesian. The results of the study indicate that the use of game-based learning can be said to be effective in increasing student engagement, creating a fun learning environment, and creating active participation. This method is able to increase student motivation to learn and develop critical skills such as problem cansolving, cooperation, and creativity. The implications of this study provide a basis for a more innovative and interesting learning approach, which can increase the effectiveness of learning at various levels of education. Therefore, game-based learning can be considered a relevant and potential solution to overcoming the challenges of student engagement in the modern education era.

ABSTRAK

Penggunaan Pembelajaran dengan menggunakan gim menjadikan pendekatan inovatif dalam hal meningkatkan keterlibatan peserta didik dalam lingkup pendidikan. Penelitian ini bertujuan untuk mendalami serta mengidentifikasi dampak dari sebuah realisasi metode pembelajaran berbasis gim kepada tingkat keterlibatan peserta didik. Metode penelitian yang digunakan yaitu studi literatur untuk dapat memetakan topik penelitian secara luas dengan mengutip sumber dari artikel jurnal ilmiah terbaru dan menggunakan Bahasa Indonesia. Hasil penelitian menunjukkan bahwa penggunaan pembelajaran berbasis gim ini dapat dikatakan efektif untuk meningkatkan keterlibatan peserta didik, membuat sebuah lingkungan belajar yang menyenangkan, dan membuat partisipasi aktif. Metode ini mampu meningkatkan motivasi peserta didik untuk belajar dan mengembangkan keterampilan kritis seperti pemecahan masalah, kerja sama, dan kreativitas. Implikasi dari penelitian ini memberikan dasar bagi pendekatan pembelajaran yang lebih inovatif dan menarik, yang dapat meningkatkan efektivitas pembelajaran di berbagai tingkat pendidikan. Oleh karena itu, pembelajaran berbasis gim dapat dianggap sebagai solusi yang relevan dan berpotensi dalam mengatasi tantangan keterlibatan peserta didik di era pendidikan modern.

Kata Kunci: berbasis gim; pembelajaran; keterlibatan peserta didik

INTRODUCTION

Effective education is not only about delivering information, but also involves active student interaction in the learning process. Education is a crucial aspect of national development, including the integration of technology (Hendriani *et al.*, 2024; Rikawati & Sitinjak, 2020). Technological developments have had a significant impact and brought about rapid changes in the world of education, including in the field of educational technology (Fauziah *et al.*, 2024). Technology in education plays a role in facilitating the learning process for both teachers and students, especially for students who have difficulty understanding lessons both in and outside the classroom. In recent years, attention has increased on innovative learning strategies, particularly regarding the use of technology in education (Rohman & Susilo, 2019). The use of this technology also needs to be a concern for schools as implementers of the learning process, including providing learning resources such as libraries and other supporting facilities (Ikrimah *et al.,* 2023).

This can lead to children quickly becoming bored with the learning methods used in schools. One interesting approach with great potential is the use of game-based learning. Game-based learning has attracted significant interest as a tool to increase student engagement in the classroom. Games are engaging and can encourage deeper involvement in the learning process. Through immersive and interactive experiences, games can create a learning environment that is both fun and educational (Hasanah & Tulianti, 2023).

Game learning media influences the use of games in learning contexts. Research shows that using games in learning makes it easier for students to understand the learning material (Hendrawan & Marlina, 2022). Other research has shown that the use of games in learning can increase student engagement, improve conceptual understanding and promote problem solving in a science context (Azizatunnisa *et al.*, 2022). This study aims to investigate the use of game-based learning to increase student engagement in the classroom. The primary focus of this study is to analyze the impact of game use in a learning context on participation levels, motivation, and academic achievement.

This study examines various relevant aspects, including effective game design, the integration of learning materials into games, and students' responses to the use of games in the learning process. An in-depth analysis of the related literature will provide a strong theoretical foundation to support the practical implications of this study. The results of this study are expected to provide deeper insights into the potential of game-based learning as an effective tool for increasing student engagement in the classroom. Additionally, this study is expected to offer practical recommendations for educators and curriculum developers on integrating game elements into the learning process.

LITERATURE REVIEW

Education Concept

Education is a common term familiar to almost everyone, especially Indonesians, who largely complete compulsory education from elementary school through high school. All aspects of human life can be enlightened through education. Education produces individuals who are beneficial to society and fosters the development of character. Education is a process of transferring knowledge and shaping personality (Maulani *et al.*, 2020). Education is a conscious effort to prepare students through guidance, teaching, and training for their future roles. In this context, education provides a platform for all groups to engage. In its role, education aims to harness all human potential; with proper implementation, all potential can be realized through education (Abdul *et al.*, 2020).

Education is closely related to the learning process. In its implementation, education requires teachers who are competent in carrying out the learning process effectively. This is crucial because, in practice, when learning is conducted in accordance with the established educational concepts, the outcomes will closely reflect the well-structured lesson plans prepared prior to the implementation of the learning process (Hamid, 2020).

Several aspects of learning in education require attention to planning, implementation, and evaluation. In this regard, it is necessary to understand and prepare a plan during the pre-implementation of a lesson, in accordance with the desired objectives. After planning, we must pay attention to the implementation process to ensure it adheres to the pre-implementation plans. After implementation, evaluation is crucial to identify areas for improvement and maintenance. Furthermore, the learning process requires careful planning of the learning environment, differentiation of instruction, character development, monitoring, and adjustments (Widiyanto & Istiqomah, 2020). Therefore, the concept of education and learning as a whole cannot be separated in the context of knowledge transfer for personality formation.

Student Involvement

Student engagement refers to the extent to which students are actively involved, mentally, emotionally, and behaviorally, in the learning process, both in and outside the classroom. This includes students' interactions with the subject matter, participation in discussions, involvement in learning activities, and their level of motivation and interest in the material being studied. Student engagement is not just about physical presence in class, but the extent to which students are mentally involved in learning, which includes their understanding of the material, willingness to ask questions, active participation in discussions, and the ability to relate lessons to personal and real-world experiences (Karnia *et al.*, 2023). Motivation is crucial in the learning process because it influences students' enthusiasm for learning, their learning objectives, and their learning achievements (Hadiapurwa *et al.*, 2021).

Student engagement can be measured by the number of active students in the learning process, both through verbal and nonverbal responses, as well as their level of concentration in participating in the learning process. This level significantly impacts the effectiveness of learning; students who are actively involved tend to achieve better learning outcomes, retain information longer, and exhibit a higher motivation to continue learning. Student engagement in learning and identifying strategies to increase active student participation in the classroom is the primary focus. The emphasis is on creating a learning environment that stimulates and encourages students to be more involved. The importance of student engagement as a significant factor in the success of the learning process is evident. This engagement encompasses aspects such as participation, motivation, interest in the subject matter, and interaction between students and the learning environment (Bahri, 2023).

The importance of student engagement in learning necessitates the implementation of more effective strategies to enhance student engagement, which is ultimately expected to impact student academic achievement positively. Factors such as positive teacher-student interactions, a relevant curriculum, and the use of teaching methods that facilitate student engagement have a significant influence on creating an active learning environment (Efendi & Sholeh, 2023). Practical strategies to increase student engagement are the primary focus, with approach models such as the use of innovative technology, collaborative learning, interactive methods (including game-based learning), and providing constructive feedback.

Games in Learning

The use of games in education has become a subject of increasing research interest in recent years, both in the form of digital games and physical games, which have become innovative tools in creating engaging

and meaningful learning experiences for students. Games in learning provide an immersive and enjoyable environment for students by utilizing elements of challenge, achievement, and interactivity. Games can motivate students to actively engage in the learning process (Ananda *et al.*, 2024). This applies in complex learning contexts, where games can help engage learners in a fun and effective way (Srimuliyani, 2023). Interactive and meaningful learning can attract students' attention (Einsthendi *et al.,* 2024; Gumelar *et al.,* 2021).

Games can facilitate problem-solving and decision-making. In games, learners are often faced with challenges that require critical, analytical, and strategic thinking to achieve in-game goals. This can be applied in learning, where learners can develop their problem-solving skills through games. Furthermore, games can enable individualized learning experiences, allowing learners to control their own pace, difficulty, and learning experience. This enables adjustments to individual learning styles, allowing learners to progress at their own pace (Nurhayati, 2020).

The use of games can strengthen collaboration and competition in learning. In specific contexts, games can serve as a platform for collaboration among students, fostering teamwork and enhancing social interaction. On the other hand, the competency aspect of games can provide additional motivation for students to improve their performance. However, it is essential to remember that the effective use of games in learning relies on the design of appropriate games and their thoughtful integration into the curriculum. Furthermore, the teacher's role in guiding learning and bridging student engagement in games with actual conceptual learning is crucial. Considering the challenges and opportunities, the use of games in learning has great potential to transform conventional learning paradigms into more engaging, meaningful, and adaptive learning experiences for students (Rezeki, 2024).

METHODS

In developing this article, a qualitative method was employed, utilizing a literature review that focused on a critical analysis of relevant and current literature on game-based learning. The use of this literature review method in this study aims to provide a comprehensive overview of the application of game-based learning to enhance student engagement and the learning media strategies employed.
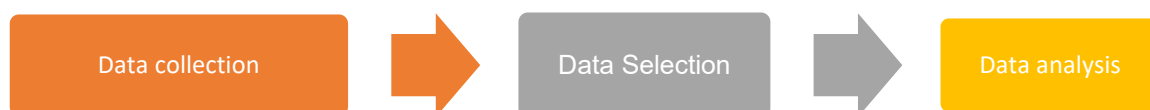

Figure 1. Stages of Literature Study
Source: Research, 2024

Based on **Figure 1**, it is evident that the stages of this research include data collection, data selection, and data analysis. Data collection was conducted using the Google Scholar search engine with the keywords "Game-based learning" and "Student engagement in learning." Data selection was then conducted to ensure that the search results met the research criteria. The source criteria were scientific journal articles from the last 5 years and written in Indonesian. The analysis technique employed was content analysis, which was used to map relevant information related to the research topic.

RESULTS AND DISCUSSION

From the results of searching for information using the Google Scholar search engine, the following results were shown:

Table 1. Information Search Results

Researcher	Year	Research Title	Research result
Whinny Qori Fatima, Livia Khairunisa, & Budi Prihatminingtyas	2020	Metode Pembelajaran Berbasis *Game* untuk Meningkatkan Ketrampilan Membaca dan Menulis Aksara Jawa	Learning methods through games are effective in improving students' abilities in writing and reading the Javanese script.
Reni Widyastuti & Listia Sari Puspita	2020	Pengembangan Media Pembelajaran Berbasis *Game* Edukasi Pada MatPel IPA Tematik Kebersihan Lingkungan	Games serve as an alternative learning medium that captures students' interest.
Baso Intang Sappaile, Laila Mahmudah, Rudy Max Damara Gugat, Baiq Fina Farlina, Ahmad Shofi & Mubarok Budi Mardikawati	2024	Dampak Penggunaan Pembelajaran Berbasis *Game* terhadap Motivasi dan Prestasi Belajar	Game-based learning has proven effective in increasing student motivation. However, challenges hindering its implementation include teacher training and costs.
Sri Haryanto, Rani Zahra, Indah Merakati, Hanafiah, Haryati, Said Nuwrun Thasimmim, & Teguh Arifianto	2024	Pembelajaran Berbasis *Game*: Pelatihan Membuat Media Pembelajaran Menarik dengan Teknologi	Training in creating technology-based learning media has shown success in improving students' design skills and self-confidence.
Virdyra Tasril, Muhammad Zen, Eka Surya Fitriani, & Agil Dwi Putra	2023	Desain UI/UX Prototipe Pembelajaran Berbasis *Game* Kosakata Bahasa Inggris dengan Metode HCD	High-fidelity prototype design in learning applications can make it easier for students to operate the application.
Maya Siti Sakdah, Andi Prastowo, & Nirwana Anas	2022	Implementasi *Kahoot* sebagai Media Pembelajaran Berbasis *Game Based Learning* terhadap Hasil Belajar dalam Menghadapi Era Revolusi Industri 4.0	Kahoot!, as a game-based learning medium, has a positive influence on improving student learning outcomes.
Rafika Andari	2020	Pemanfaatan Media Pembelajaran Berbasis *Game* Edukasi *Kahoot*! pada Pembelajaran Fisika	Kahoot! learning media has been proven to improve learning outcomes better than PowerPoint learning media.
Sulfi Purnamasari, Fika Rahmanita, Soffi Soffiatun, Wiwit Kurniawan, & Fiqoh Afriliani	2022	Bermain Bersama Pengetahuan Siswa melalui Media Pembelajaran Berbasis *Game Online Word Wall*	The socialization of the Word Wall game-based learning media reveals that most teachers are already proficient in operating the game and utilizing it as a learning medium.
Cahyani Amildah Citra & Brillian Rosy	2020	Keefektifan Penggunaan Media Pembelajaran Berbasis *Game* Edukasi *Quizizz* terhadap Hasil Belajar Teknologi Perkantoran Siswa Kelas X SMK Ketintang Surabaya	Quizizz, as a game-based learning media, has proven effective in improving student learning outcomes.
Destri Sambara Sitorus & Tri Nugroho Budi Santoso	20222	Pemanfaatan *Quizizz* sebagai Media Pembelajaran Berbasis Game pada Masa Pandemi Covid-19	Quizizz, as a distance learning medium, has been proven to create a more engaging and less tedious learning environment.
Jhon Enstein, Vera Rosalina Bulu, & Roswita Lioba Nahak	2022	Pengembangan Media Pembelajaran *Game* Edukasi Bilangan Pangkat dan Akar menggunakan *Genially*	The "PangKar" game is a learning tool developed using Genially,

Researcher	Year	Research Title	Research result
			suitable for students to use independently to learn numbers.
Nur Hasanah	2023	Pengembangan Media Pembelajaran Berbasis *Game* Tebak Operasi Matematika yang Berorientasi pada Kemampuan Berpikir Kritis	Game-based mathematics learning media have been proven effective in improving students' critical thinking skills.
Uswatun Khasanah, Fatma Sukmawati, Meti Fatimah, & Mujibburohman	2022	Pelatihan Pembuatan Media Pembelajaran Berbasis *Game* bagi Guru-Guru Madrasah Ibtidaiyah	Training in creating learning media for teachers can enhance teachers' skills in utilizing game-based learning media, such as Kahoot!
Rina Puspitasari, Suparman & Fahrunnisa	2022	Pengaruh Media Pembelajaran *Kahoot* Berbasis *Game Based Learning* terhadap Minat dan Hasil Belajar Siswa	There is an influence between the learning media Kahoot! and learning outcomes, as well as students' interest in learning.
Natalis Sukma Permana	2021	Implementasi Aplikasi *Kahoot* sebagai Media Pembelajaran Berbasis Game dalam Pelajaran Pendidikan Agama Katolik	Implementing Kahoot! as a learning medium requires adequate facilities and teacher skills.
Ogi Danika Pranata	2023	Penerapan *Game-Based Learning* sebagai Alternatif Solusi Mengajar di Kelas Heterogen	Game-based learning media increases students' motivation, courage to express opinions, activeness, and understanding of the material.
Arje Cerullo Djamen, Parabelem Tino Dolf Rompas, & Marvil Ratumbanua	2022	Pengembangan Media Pembelajaran Berbasis *Game* Edukasi Mata Pelajaran Ilmu Pengetahuan Alam di SMP	Multimedia-based learning media applications have proven to be more informative for teachers and have the potential to increase student motivation.
Ary Yulianti & Ekohariadi	2020	Pemanfaatan Media Pembelajaran Berbasis Game Edukasi Menggunakan Aplikasi Construct 2 pada Mata Pelajaran Komputer dan Jaringan Dasar	Game-based learning applications offer convenience, interactivity, and a great user experience. However, on the other hand, these learning tools require a significant amount of storage space.
Dhenisha Agustine Fadilla & Sarah Nurfadhilah	2022	Penerapan *Gamification* untuk Meningkatkan Motivasi Belajar Siswa dalam Pembelajaran Jarak Jauh	Gamification learning methods have been proven to increase student motivation and teacher-student interaction.
Maitsa Amila Shaliha & Moch Raka Fakhzikril	2022	Pengembangan Konsep Belajar dengan Gamifikasi	Gamification learning media can increase students' learning motivation, engagement, cognitive, affective, and psychomotor skills.
Tatang Suryadin	2022	Motivasi Belajar Siswa dan Keterlibatan Siswa dalam Pembelajaran Daring Pendidikan Jasmani	Online learning has an impact on students' motivation and engagement in sports lessons.
Ayu Ariyana Mulyani, Elly Malihah Setiadi, & Siti Nurbayani	2023	*Backward Design* : Strategi Pembelajaran dalam Meningkatkan Keterlibatan Siswa	Backward Design is an effective learning model for increasing motivation, student involvement, and student understanding.

Researcher	Year	Research Title	Research result
Mareta Nurrindar & Eko Wahjudi	2021	Pengaruh *Self-efficacy* terhadap Keterlibatan Siswa melalui Motivasi Belajar	Self-efficacy has a significant positive effect on student engagement, and motivation has a significant positive effect on both student engagement and student learning motivation.
Gabriel Nababan, Jun Extin Loyalti Purba, & Kristina Anugerah Aji	2021	Mengukur Keterlibatan Siswa dalam Pembelajaran Online Siswa Kelas VII di Sekolah ABC pada Pembelajaran Matematika	There is no difference in the involvement of female and male students in online mathematics learning.
Josephine Natasha Marpaung & Wiputra Cendana	2020	Keterampilan Menjelaskan Guru untuk Membangun Minat Keterlibatan Siswa dalam Pembelajaran Online	The teacher's intonation and expression when teaching using the online lecture method have an impact on student engagement.

Source: Research, 2024

Based on the sources in **Table 1**, it is known that using games as a learning medium has a positive impact on both teachers and students. However, its implementation requires significant costs due to the need for training and adequate infrastructure. Nevertheless, some teachers already understand how to use game applications for learning. Furthermore, learning methods utilizing technology-adapted learning media have been shown to increase student engagement.

Discussion

Student involvement in online learning requires support through effective learning strategies, enabling students to engage actively in the learning process (Suryadin, 2022). Online learning strategies that teachers can implement through lecture methods, utilizing intonation and expression, so that students pay attention to the material provided (Marpaung & Cendana, 2020). Student involvement in learning does not take into account the gender of the student, resulting in no significant difference in the involvement of female and male students (Nababan *et al.*, 2021). Students' self-efficacy in learning has a positive influence on students' involvement and students' learning motivation (Nurrindar & Wahjudi, 2021). One learning model, Backward Design, can be implemented by teachers to increase motivation, student engagement, and understanding. Currently, learning media continues to evolve, creating innovative game-based learning media that support student engagement (Mulyani *et al.*, 2023).

Game-based learning is a learning approach that uses game elements to increase student engagement and understanding (Widyastuti & Puspita, 2020). Games can serve as an informative learning medium for teachers, increasing student motivation and learning outcomes (Djamen *et al.*, 2022; Citra & Rosy, 2020; Sakdah *et al.*, 2022). In addition, game-based learning media can improve student interaction, critical thinking skills, psychomotor skills, courage, activeness, and understanding of the material (Fadilla & Nufadhilah, 2022; Hasanah, 2023; Pranata, 2023; Shaliha & Fakhzikril, 2022). Students prefer game-based learning compared to PowerPoint media (Andari, 2020).

Game planning and design involves first identifying learning objectives, selecting appropriate content, and designing a game that takes learners' needs into account. This stage serves as the foundation for a practical learning experience. Second, game implementation involves introducing learners to the game, providing clear instructions, and monitoring their progress throughout the game. This is the stage where learners truly participate in the learning experience. The next step focuses on understanding the content and integrating learning materials with game elements. After playing, additional explanations and

discussions are held to ensure conceptual understanding. The use of games in learning can help learners improve their reading and writing skills (Fatima *et al.*, 2020).

Feedback plays a crucial role in game-based learning media. Learners receive in-line feedback during gameplay for immediate instruction, and final feedback is provided at the end of the game. This provides information on learner performance and areas for improvement. Reflection and evaluation involve reflecting on the gameplay experience and evaluating its effectiveness. Literacy and improvement occur through updating the game based on feedback and evaluation, as well as by developing new games and variations that encourage learner participation. Learners can engage in enjoyable learning through this learning media, creating a rewarding experience and encouraging learners to have fun while learning (Sitorus & Santoso, 2022).

Effective game design appropriately integrates learning content and game context. Success depends on adapting to the game as learners progress. Interactive monitoring during play provides instant feedback, and learning data analysis helps understand learner performance. It is essential to master challenges such as time management and various game types. Game developers and educators can collaborate to design games that align with the curriculum and learning objectives (Tasril *et al.*, 2023). Currently, developers have created many games that can be used as learning media, such as Kahoot!, Quizizz, Word Wall, Pangkar (Enstein, 2022; Purnamasari *et al.*, 2022; Sitorus & Santoso, 2022; Puspitasari *et al.*, 2022).

Game-based learning media require adequate facilities and teacher competence in implementation (Permana, 2021). Teachers need to be trained in using game-based learning so they can apply it effectively in the educational process (Khasanah *et al.*, 2022). Incorporating game-based learning into the curriculum requires a thoughtful and pedagogically relevant approach to the context (Haryanto *et al.*, 2024). Success can be assessed by measuring student learning outcomes, providing direct feedback, and providing teacher training. Overall, student engagement can be enhanced through game design that considers student needs and encourages them to reflect on their learning experiences (Sappaile *et al.*, 2024).

There are several strategies for implementing gamification that can be used in the classroom, namely: a) Identifying learning objectives to improve conceptual understanding, critical thinking skills, and increasing student engagement; b) Designing game challenges and objectives that are interesting and relevant to the learning material; c) Rewarding and recognizing students who achieve learning objectives; d) Using Scores, Levels, and Points to track student progress and provide additional motivation. Students earn points based on their performance in assignments and exams, and can advance to higher levels when they meet specific objectives; e) Utilizing digital technology and online learning platforms to support the implementation of gamification; f) Collaboration and competition in gamification; and g) Adaptability and flexibility based on student responses and learning needs effectively by conducting evaluations using user experience (Yulianti & Ekohariadi, 2020).

CONCLUSION

This game-based learning process can have a positive influence on students. This game-based learning can encourage students to be more daring and active in classroom learning. The game-based learning approach increases student understanding and engagement in the classroom. Student involvement in learning and identifying strategies to increase active student participation in the classroom is the primary focus. This effort aims to create a stimulating learning environment and encourage students to engage more deeply. Games in learning provide an immersive and enjoyable environment for students. By incorporating elements of challenge, achievement, and interactivity, games can motivate students to engage actively in the learning process.

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