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Game based learning as a learning method in developing students' learning interest

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Abstract
Game Based Learning (GBL) provides an interactive and fun learning experience, increasing students' cognitive and emotional engagement through the use of educational games equipped with technology such as simulations, strategic challenges, VR, and AR. This technology not only increases motivation but also develops students' critical thinking skills. However, there are major challenges in implementing GBL, namely maintaining a balance between entertainment elements and learning objectives, and overcoming limited access to technology that causes inequalities in students' learning experiences.

1. Introduction

Game-based learning (GBL) has become an increasingly popular pedagogical approach in education. The use of educational games in the classroom is not only aimed at overcoming boredom, but also to create a more interactive and engaging learning experience for students. This approach can enliven the learning atmosphere and encourage student involvement, so it can be an alternative to replace traditional methods that often make students lose interest (Okoye et al., 2023). Furthermore, the use of games in learning is designed to trigger students' cognitive and emotional responses. Explains that interactive elements in educational games can enhance students' understanding of subject matter in ways that cannot be achieved through conventional methods (Setiawan et al., 2019). By utilizing in-game technology, such as simulations or strategic challenges, students engage in critical thinking processes that can strengthen their cognitive skills. Adding that in-game challenges that require strategy also help improve these skills (Brandl et al., 2023).

However, implementing GBL is not without challenges. One of the main obstacles is designing games that balance entertainment elements and learning objectives. Students can easily be distracted by entertainment elements, thereby losing the essence of learning (Siemon, 2017). Therefore, it is important for game developers and educators to ensure that game elements do not defeat the purpose of education, but rather support it in a balanced and effective manner. The need for appropriate game design strategies to focus on achieving pedagogical goals is emphasized (Barna et al., 2018). As technology advances, games based on advanced technology, such as virtual reality (VR) and augmented reality (AR), are becoming an interesting choice to be implemented in GBL. VR can create an immersive and deep learning experience, allowing students to feel more connected to the content being learned (Aziz et al., 2021). This approach allows students to learn in a more practical and contextual way, increasing the effectiveness of learning through well-designed experiences.

While technologies such as VR offer great opportunities, the gap in technology access among students poses a significant challenge to the implementation of GBL. Not all students have equal access to the technology tools needed for educational games, which creates inequities in the learning experience. Students with less access to technology may lag behind their peers with better access, and this gap needs to be addressed in order for GBL to be implemented effectively and inclusively across schools (SY Lin & Scherz, 2014). In addition to access issues, the effectiveness of GBL also depends heavily on the instruction and approach used in the game. Instruction focused on goal achievement sometimes only boosts motivation without producing significant improvements in learning outcomes (Rahayu et al., 2022). Therefore, it is important to consider approaches that are not only outcome-oriented, but also pay attention to the learning process and emotional involvement of students. Several studies emphasize the importance of collaborative elements in games to strengthen social skills and teamwork. Games designed with social interaction elements can create more authentic and meaningful learning experiences (Al-Adwan et al., 2023). This integration of collaboration allows students to

learn to work together and support each other in solving challenges, building interpersonal skills that are important for their future success.

However, even though GBL has many benefits, this approach cannot completely replace traditional learning methods. Although students are more emotionally and cognitively engaged in GBL, conventional methods are still needed to complement and strengthen the learning experience provided by games. Combining the two can provide a more comprehensive and diverse learning experience, thus covering the various needs of students (Aburahma et al., 2015). After searching from various reference sources that have been obtained, from various news media and articles on websites, it was concluded that it was drawn into several questions, including:

a. How to maintain a balance between gamification and achieving learning objectives so that students are not distracted by game elements?

b. How to design effective learning games that suit students' needs to increase their interest and understanding?

2. Method

The research design used in this study is descriptive. This study was conducted using the SLR method or systematic literature review by collecting data through the PRISMA method on studies that discuss Game Based Learning (GBL). Research using SLR was conducted to obtain information from existing studies and sourced from databases such as ScienceDirect, Springer and IEEE with the aim of getting an overview of what problems occur in the teaching and learning process in academic life and what learning models are popularly used globally (Alaswad et al., 2015)

PRISMA is a guideline that provides a structured process in identifying, selecting, and analyzing relevant studies, thus ensuring that the data collection process is carried out systematically and transparently. This process involves screening research articles based on predetermined inclusion and exclusion criteria, as well as extensive literature searches in various major databases to ensure broad coverage and relevance to the research topic (Karagiorgas et al., 2017). The following are the results of searching for several articles with data collection using the PRISMA method.

Contains the methods used in the research. Show a brief description of the materials and methods used in the research. all quantities are in standard and consistent units; each equation must be numbered; the research method or stage is described operationally, not explaining the definition or understanding.

The method consists of research design/stages, subjects, locations, experimental designs or designs used, sampling techniques (if any), the samples used must be specific and clear in number, variables to be measured, research instruments, data collection techniques, data analysis techniques (Adjust to the type of research. If the research is qualitative, it is better to use data triangulation).

3. Results and Discussion

Game-based learning (GBL) is currently gaining more attention in the world of education, considering that this approach provides an interactive and enjoyable learning experience for students. This GBL approach is said to be able to increase students' cognitive and emotional involvement. Effective technology integration in educational games has a positive impact on student engagement and learning outcomes (Troyer et al., 2017). Features such as badges and leaderboards are not only eye-catching but also able to motivate students to achieve better results. With these elements, students feel more challenged and motivated in completing tasks, something that conventional learning methods have not been able to produce optimally (Karabulut-Ilgu et al., 2018).

Apart from these features, students' learning experiences can be more in-depth if games are equipped with technology such as augmented reality (AR) (Karakoç et al., 2022). With AR, students not only see or hear information but can interact directly with a more contextual and realistic learning environment. For example, in history learning, AR allows students to feel as if they are in a historical location or interact with objects that are usually only found in textbooks. This creates a much more lively and relevant learning experience for students.

However, behind the various benefits of GBL, there are quite significant challenges, especially in maintaining a balance between entertainment elements and learning objectives. Entertainment elements are too dominant, students can lose focus on the main goal of learning, namely mastery of the material. Therefore, educational game design must pay attention to the integration between entertainment elements and desired educational outcomes. To achieve optimal learning outcomes, game elements must be tightly integrated with learning objectives, not just included as additional entertainment (Alaswad et al., 2015b).

In addition to increasing cognitive engagement, GBL also plays a role in developing students' social skills through collaborative elements. Game design with dual scaffolding, which includes peer and cognitive scaffolding, can strengthen students' social engagement. When students work together to discuss strategies and solve challenges in the game, they not only learn the material, but also develop their social skills (YC Lin & Hou, 2023). Collaborative gameplay not only helps improve social skills but also enriches students' cognitive understanding through meaningful discussions and collaboration (Nørgård et al., 2017).

However, another challenge arises regarding access to technology. Not all students have adequate access to the technological devices needed to engage in GBL. It is argued that this limited access hinders the inclusive effectiveness of GBL, as students who do not have technological devices tend to lag behind those who have better access. This is reinforced by the study that found this inequality of access has the potential to create gaps in learning experiences. Students who have access to educational games tend to be more successful than those who do not, which ultimately results in inequality in learning outcomes (Herro et al., 2016).

Further research shows that students' learning motivation can be significantly increased by using GBL. which compared GBL with traditional learning methods found that educational games, especially mobile-based ones, were more effective in attracting attention and increasing student engagement compared to textbook-based learning. Elements in games, such as challenges and achievements, can create deep and interactive engagement, resulting in a learning experience that is not only fun but also rewarding (Karagiorgas et al., 2017).

Overall, the implementation of GBL in education can be effective if supported by a design that pays attention to the balance between entertainment elements and educational goals, equal access to technology, and the integration of collaborative elements that can support the development of students' social skills. Arguing that the integration of structured technology in educational games provides good guidance for developers to create games that are not only interesting but also educationally effective. On the other hand, a collaborative approach in games helps students build social skills that will be beneficial for their future (Chou et al., 2024). Contains research results and discussions. If it is R&D research, the final product needs to be displayed, especially content related to the research title.

4. Conclusion

The conclusion of the content is that Game-Based Learning (GBL) has become an increasingly popular approach in education because it is able to increase students' cognitive and emotional engagement through interactive learning experiences. Educational games have the potential to motivate students and encourage critical thinking skills, especially through features such as simulations, strategic challenges, and immersive technologies such as VR and AR. However, the implementation of GBL faces several challenges, such as the difficulty of maintaining a balance between entertainment elements and learning objectives and limited access to technology that creates inequities in students' learning experiences. In addition, game design must consider collaborative elements to support the development of social skills and holistic student engagement.

Descriptive research method with systematic literature review (SLR) approach using PRISMA shows that GBL is effective if designed carefully with a focus on educational goals and equal access. Therefore, the integration of GBL in education can provide a comprehensive learning experience if supported by a design that pays attention to the balance between entertainment and education as well as equal access to technology.

Further research on game-based learning (GBL) can lead to the development of an optimal GBL design model, which is able to balance entertainment elements and learning objectives, so that distractions from excessive entertainment aspects can be minimized and the focus on educational achievement is maintained. In addition, strategies are needed to overcome the limitations of technology access, which is often a barrier to the implementation of GBL, for example by developing more affordable device-based games or using a collaborative approach with simple technology to make it more accessible.

On the other hand, further research can also examine the impact of collaborative elements in GBL on students' social skills, such as teamwork, communication, and interpersonal skills that are important in learning. Furthermore, most current studies only review the short-term effects of GBL; therefore, it is important to explore its long-term impact on students' comprehension, knowledge retention, and cognitive skill development. Furthermore, the use of immersive technologies such as VR and AR has great potential in creating a more immersive learning experience; therefore, it is important to examine the extent to which these technologies can influence students' contextual understanding and application of knowledge to real situations. Finally, because each student has different characteristics and learning styles, further research can also map the types of games that suit individual needs, so that the resulting game design can support learning effectiveness more comprehensively.

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