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The Role of Digital Game-Based Learning in Enhancing Self-regulated Learning Strategies: A Case Study Among Bina Mandiri Gorontalo University Students

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Abstract

This study aims to explore the role of Digital Game-Based Learning (DGBL) in improving Self-Regulated Learning (SRL) in students of Bina Mandiri Gorontalo University. Using a qualitative approach with a case study design, data was collected through in-depth interviews, participatory observations, and documentation of 30 students from the Educational Technology, Management, and Pharmacy study programs. The results of the study show that DGBL has a positive impact on the development of student SRL, especially in the aspects of learning planning, time management, motivation regulation, and self-evaluation. Students take advantage of the interactive and flexible features of digital games to set the rhythm and learning strategies according to their individual needs. However, challenges were also found such as potential distractions due to focusing too much on the game elements. In general, these findings reinforce that DGBL can be an effective alternative learning strategy that is relevant to the current context of higher education, especially in building student learning independence. This research is expected to be the basis for the development of digital learning policies in universities, especially in developing regions.

Keywords: Digital Game-Based Learning, Self-Regulated Learning, Self-Directed Learning.

Introduction

In this modern era, the use of textbooks and face-to-face lectures makes learning no longer limited to existing traditional methods. Advances in technology have opened up a wide range of new possibilities. One possibility is about Digital Game-Based Learning (DGBL). According to Nurdin, Rejekiningsih, & Sumaryati. (2023) DGBL really combines educational content with digital game mechanisms, so that a much more interactive and interesting learning experience for students is created. A much more interesting and interactive learning experience for students at the university level can be provided through learning that integrates educational materials with digital game elements. DGBL offers an alternative way to absorb and apply knowledge much more effectively and enjoyably for students who often face very high academic challenges.

One of the important aspects of successful learning in college is Self-Regulated Learning (SRL), which is the ability to plan, the ability to monitor, and the ability to evaluate the learning process independently. According to Sidiq & Magistarina. (2024) Students with high SRL tend not to do academic procrastination so that they become more capable of meeting academic demands optimally. Students who are disciplined, able to

manage time well, and easily adapt to various academic demands tend to have very good SRL skills. However, this skill is not naturally possessed by all existing students. Many of us still have difficulty staying motivated or managing our time. They also have difficulty finding the most effective learning strategies for themselves.

In this regard, Digital Game-Based Learning is emerging as a promising tool to improve Self-Regulated Learning Strategies. Digital games present various elements, such as challenges, instant feedback, and an exploratory environment, which can increase engagement, independence, and perseverance in learning (Chu et al., 2023). In addition, digital games also offer flexibility, allowing students to set the tempo and structure of their learning according to their individual needs and learning styles.

Although previous research has shown that digital games can improve student motivation and learning outcomes, there is still a gap in understanding how DGBL specifically contributes to the development of Self-Regulated Learning strategies. students of Bina Mandiri University Gorontalo as a case study based on campus conditions that are adapting to technological developments in learning. Students on this campus show variations in Self-Regulated Learning (SRL) abilities, making it a good target to examine how Digital Game-Based Learning (DGBL) can contribute to increasing their learning independence. In addition, the application of digital-based learning technology, including educational games, is still relatively new, thus opening up opportunities to see the influence of this innovation more really.

In addition, the diverse backgrounds of Bina Mandiri Gorontalo University students provide a comprehensive overview of the effectiveness of DGBL in the context of higher education in developing regions. With this focus, the research is expected to not only provide local benefits for the development of learning on campus, but also contribute to improving the quality of education in other universities in Indonesia. Therefore, this study aims to explore this relationship with a focus on students of Bina Mandiri Gorontalo University.

Methodology

This study uses a qualitative approach with a case study design, which aims to understand in depth how *Digital Game-Based Learning* (DGBL) contributes to the improvement of *self-regulated learning* strategies (SRL) in students of Bina Mandiri Gorontalo University. The qualitative approach is considered the most appropriate in this context because it provides space for researchers to explore students' experiences, perceptions, and internal dynamics in the learning process that occurs contextually and naturally. As stated by Creswell, J. W., & Poth, C. N. (2016), a qualitative approach is suitable when researchers want to gain a deep understanding of the subjective meaning, participant perspectives, and social processes that occur in a particular environment.

The population of this study consists of students at Bina Mandiri Gorontalo University from the Educational Technology, Management, and Pharmacy study programs. These programs were selected to represent diverse academic backgrounds and learning characteristics. This diversity provides a broader perspective on the contribution of DGBL to self-regulated learning strategies. It also allows comparison across different fields of study.

The sample includes 30 students selected purposively, with 10 students from each study program. Purposive sampling was used to ensure participants met the research objectives. The criteria included active students with experience in digital learning, especially educational games. Participants were also required to have independent learning experience and be willing to participate in in-depth interviews.

Data collection was conducted using a qualitative approach through in-depth interviews, participatory observation, and documentation. These methods were selected to obtain a comprehensive understanding of the contribution of Digital Game-Based Learning (DGBL) to students' self-regulated learning strategies. The combination of techniques allows data triangulation for greater validity. This approach helps capture both perceptions and real learning behaviors.

In-depth interviews were conducted with nine students from the Educational Technology, Management, and Pharmacy study programs. The interviews were semi-structured to explore learning experiences and perceptions of DGBL. They focused on key aspects of self-regulated learning, such as planning, self-monitoring, and time management. This method provided detailed insights into students' learning strategies.

Participatory observation was carried out by directly observing students' learning activities using educational games. The observation captured student engagement, interaction patterns, and learning dynamics during lectures and independent study. Findings were recorded systematically through field notes to support interview results. Documentation was also used to complement and confirm data from interviews and observations.

Data analysis was conducted qualitatively using thematic analysis to identify meaningful patterns from complex data. Interviews were transcribed verbatim and read repeatedly for in-depth understanding. Observation and documentation data were analyzed triangulatively to strengthen the findings. Relevant data were coded and grouped into themes describing the influence of DGBL on students' self-regulated learning.

Results

Comparison of Themes by Gender

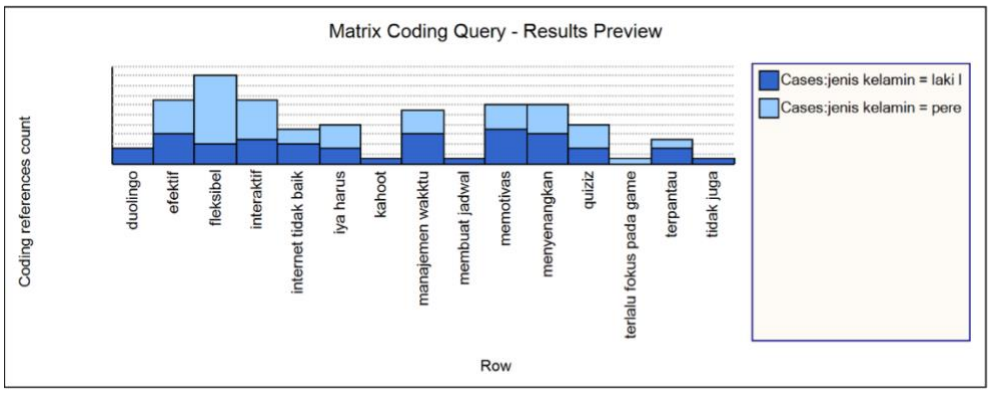

Figure 1. Comparison of Themes by Gender

Based on NVivo analysis, coding frequency visualizations showed students' perceptions of Digital Game-Based Learning (DGBL) in supporting self-regulated learning (SRL). Male and female students responded differently to DGBL features. Female students highlighted themes such as "flexible," "interactive," and "effective." This indicates that flexible learning time and rhythm help students design independent learning according to their style.

Male students showed high responses to themes like "motivating," "fun," and "time management." Gamification elements in applications like Duolingo, Kahoot, and Quizizz increase enthusiasm and support cognitive engagement. DGBL helps students structure their learning and maintain discipline. This reflects its positive role in independent learning activities.

Minor negative themes such as "too focused on the game" and "glued" were also observed. These issues are more common among male students. They suggest that DGBL can distract if not integrated properly. Careful design is needed to avoid barriers to SRL.

Overall, DGBL significantly supports SRL in planning, time management, motivation, and active learning. Differences by gender indicate varying approaches to using DGBL. These findings can guide inclusive and effective learning strategy design. DGBL should be applied thoughtfully to maximize benefits and minimize distractions.

Comparison of Themes by Study Program

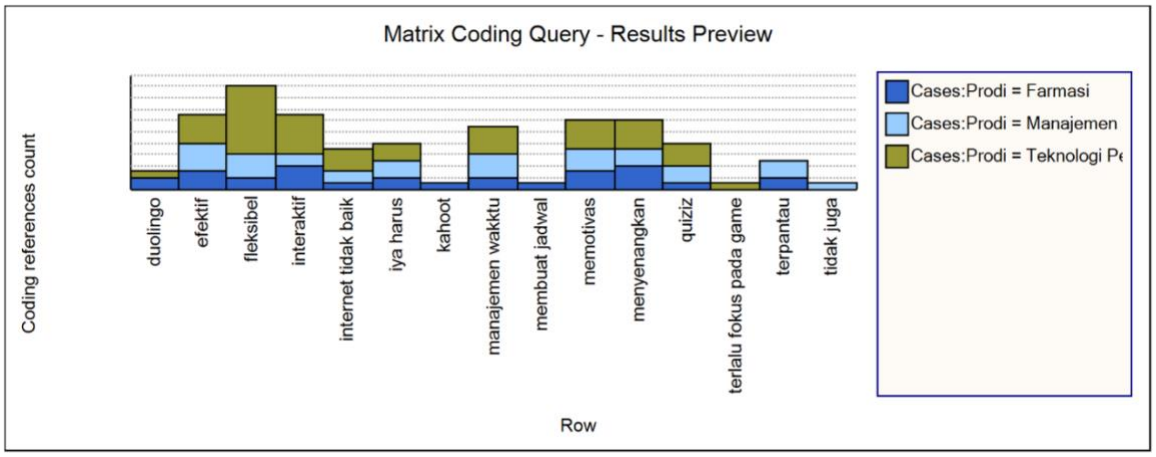

Figure 2. Comparison of Themes by Study Program

The results of the thematic analysis, visualized through the Matrix Coding Query graph, show that students' perceptions of Digital Game-Based Learning (DGBL) vary across study programs. Pharmacy, Management, and Educational Technology students demonstrated different levels of engagement with DGBL features related to self-regulated learning (SRL).

Themes of "flexible" and "interactive" were most prominent among Educational Technology students, reflecting their familiarity with technology and appreciation for innovative learning methods. They also linked DGBL with benefits such as "effective," "motivating," and "fun," using the game features to enhance engagement and support independent learning.

Pharmacy and Management students also recognize strategic benefits of DGBL, though less intensely than Educational Technology students. Pharmacy students highlighted "time management," "scheduling," and "Quizizz" as tools for self-evaluation that support learning. These themes reflect the structured and precise nature of their study program. DGBL helps them plan and monitor their independent learning effectively.

Management students emphasized "flexible," "Duolingo," and "Kahoot" as media that promote engagement and active learning. Minor negative themes, such as "too focused on the game" and "glued," were also observed. These suggest potential distractions during

learning, though they were infrequent. The findings highlight the need for careful DGBL integration to support SRL without reducing learning effectiveness.

Discussion

This study aims to analyze the role of *Digital Game-Based Learning* (DGBL) in improving *Self-Regulated Learning* (SRL) strategies in students of Bina Mandiri Gorontalo University, taking into account the background of their study program. The findings show that students' experiences and perceptions of DGBL are greatly influenced by their respective study programs. This indicates differences in the way students from different courses adapt and utilize DGBL for their independent learning strategies.

Students from the Educational Technology study program showed the highest frequency in mentioning themes such as "flexible", "interactive", and "effective" related to DGBL. This strongly supports their SRL development. Most likely, their proximity to digital media and innovative learning concepts makes them more capable of adjusting the learning tempo, evaluating progress, and applying independent learning strategies optimally. This high engagement is also seen in the "motivating" and "fun" categories, indicating that DGBL provides a significant intrinsic boost in their learning process (Maulidina et al., 2018).

The flexibility offered by DGBL allows Educational Technology students to choose the order of game themes and determine if they want to play multiple themes with additional content, so they have complete control over their learning. The interactive aspect of DGBL, as demonstrated by the game adapting to the student's profile and providing personalized feedback, is helpful in improving their performance and engagement. In addition, the effectiveness of DGBL in promoting computational thinking and improving student learning achievement is also in line with the characteristics of SRL which emphasizes the individual's ability to regulate mental processes and achieve learning goals (Farichah, 2012).

Meanwhile, students from the Management study program show a fairly balanced tendency in the use of DGBL. Their focus on the "effective" and "flexible" aspects shows that they view DGBL as a medium that supports the understanding of concepts efficiently

and can be used to manage study time independently. The adaptive and personalized use of media such as "Kahoot" and "Duolingo" supports their goal of improving learning outcomes and motivation (Nurhasanah & Hamidah, 2024).

An adaptive approach in DGBL, where content is tailored to an individual's skill level and needs, has been shown to increase learner satisfaction, engagement, and motivation. This is in line with the view of Management students who are looking for efficiency and independence in their learning process. The ability of DGBL to provide personalized help and adapt to the level of difficulty based on student performance is also an important factor that supports its effectiveness for this group (Chiotaki, Poulopoulos, & Karpouzis, 2023).

Pharmacy students, although using DGBL less frequently, focus on structured themes such as scheduling, time management, and the use of Quizizz for learning reflection. This reflects their systematic learning style and content-heavy curriculum, where DGBL serves as an independent learning and evaluation tool. However, issues such as excessive focus on games may interfere with time management and self-regulated learning. Therefore, DGBL must be carefully designed to support self-regulation and minimize potential negative effects (Nurdin et al., 2023).

Digital game-based learning (DGBL) supports 21st-century skills such as critical thinking, communication, collaboration, and innovation. It encourages active inquiry, increases student motivation, and reduces passive learning through engaging media like educational games. Research shows that DGBL effectively improves learning activity, motivation, and self-regulated learning (SRL). However, its effectiveness depends on students' digital readiness and academic context, so DGBL should be designed adaptively.

Digital Game-Based Learning

Digital Game-Based Learning (DGBL) is an educational innovation that integrates game elements into the learning process. This approach is designed to make learning more engaging and interactive. DGBL encourages students to actively participate in learning activities. As a result, students' understanding of learning materials can improve effectively.

Digital Game-Based Learning (DGBL) is a learning approach that provides a flexible and adaptive learning experience, as stated by Zhang et al. (2024). This approach allows students to learn according to their own pace and learning style, thus providing flexibility in the learning process. With the ability to adjust learning strategies and rhythms personally, DGBL is considered a promising alternative in increasing learning effectiveness, especially in the higher education environment.

In line with that, Maulidina, Susilaningsih, & Abidin. (2018) emphasizing that game-based learning utilizes digital game media not only to convey material, but also to deepen understanding and knowledge, as well as support the assessment process in a field of science. Further, Nurhasanah & Hamidah. (2024) added that Game-Based Learning (GBL) is a learning method that integrates game elements into the learning process. This approach not only increases students' motivation to learn, but also plays a role in developing literacy skills, other skills, and can even be used as a therapeutic medium to support students' emotional and cognitive aspects.

It can be concluded that Digital Game-Based Learning (DGBL) or Game-Based Learning (GBL) is a learning approach that integrates elements of digital games to create a flexible, adaptive, and interactive learning experience. DGBL not only allows students to learn according to their own pace and style, but also deepens their understanding of the material, improves knowledge, and supports the academic evaluation process. In addition, this approach has been proven effective in increasing learning motivation, developing literacy and skills, and functioning as a therapeutic medium that strengthens the emotional and cognitive aspects of students. Therefore, DGBL is a strategic alternative to increase the effectiveness of learning, especially in the context of higher education.

Self-Regulated Learning Strategies

Self-Regulated Learning (SRL) is an individual's ability to actively manage their learning process independently. Students with good SRL skills tend to be able to plan learning goals, choose the right strategy, monitor progress, and evaluate the learning outcomes that have been achieved. Students with good SRL skills are more disciplined, able to manage time effectively, and have high intrinsic motivation. However, not all

students have these skills naturally, so interventions that can help develop their SRL skills are needed (Li, Xia, Chu, & Yang, 2022).

According to Farichah. (2012) *self-regulated learning* is an ability that involves the active role of students in managing their learning process independently. This ability includes regulating metacognitive, motivational, and behavioral aspects related to learning. Students are required to be able to plan, monitor, and evaluate their learning activities consciously and in a directed manner, so that the learning process becomes more effective and in accordance with the goals to be achieved. In other words, *self-regulated learning* It is not only about learning independently but also reflects the responsibility of students in controlling every aspect that affects their learning success.

Self-regulated learning (SRL) is a process in which students independently manage their learning by setting goals, applying strategies, and monitoring progress. It emphasizes active and conscious control over learning rather than passive responses to external factors. SRL supports learner independence through effective planning, time management, and proactive information seeking. Factors influencing SRL include individual characteristics, motivation, self-efficacy, goals, metacognitive awareness, and the use of effective learning strategies.

The Relationship Between Digital Game-Based Learning and Self-Regulated Learning

Digital Game-Based Learning has great potential in supporting the development of self-managed learning strategies. Through elements such as gradual challenges, instant feedback, and reward systems, students are encouraged to actively set learning goals, monitor ongoing processes, and evaluate achievements. This process is highly aligned with the main components in SRL (Chu et al., 2023).

In addition, DGBL allows students to adjust their learning rhythm, choose material exploration paths, and develop critical thinking and problem-solving skills. A flexible and interactive learning environment like this indirectly strengthens students' learning independence and sense of responsibility for the academic process they undergo. And

DGBL also contributes to increasing student motivation and engagement, which is an important factor in the development of SRL (Nurdin et al., 2023).

Digital *Game-Based Learning* (DGBL) has a significant role in encouraging the development of *self-regulated learning* strategies. Through various features such as phased challenges, hands-on feedback, and a motivating reward system, DGBL helps students to actively set goals, supervise the learning process, and assess the results that have been achieved. In addition, the flexibility offered in determining the learning pace and material path allows students to develop independence, responsibility, and critical thinking and problem-solving skills. This interactive learning environment also increases student motivation and participation, which is an important element in supporting the success of a self-directed learning strategy.

Although various studies have shown the benefits of DGBL in improving motivation and learning outcomes, further study is still needed on the extent to which this approach can contribute directly to the development of SRL skills, especially in the context of higher education in Indonesia. Therefore, it is important to explore the relationship between DGBL and SRL in more depth, including within Bina Mandiri Gorontalo University, to provide a more comprehensive and applicable understanding in the world of education.

Conclusion

Based on the results of this study, it can be concluded that *Digital Game-Based Learning* (DGBL) has a significant positive role in improving *Self-Regulated Learning* (SRL) strategies in students. This improvement can be seen from various aspects of SRL, such as metacognition, motivation, and behavior, where students show better ability to set goals, monitor progress, and manage their study time. However, there are differences in the way DGBL is used and perceived among students from different study programs, indicating the need for a tailored approach to optimize its effectiveness.

For further research, it is recommended to develop a more adaptive and deeply personalized DGBL design, not only based on the level of difficulty, but also taking into account the individual characteristics of the students such as their learning style, confidence level, and affective condition. In addition, it is also important to integrate more

sophisticated feedback mechanisms that can help students overcome distractions and maintain focus on learning objectives, as well as conduct longitudinal studies to observe the long-term impact of DGBL on SRL development and academic achievement

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Declaration of Interest Statement

The authors declare that there is no conflict of interest regarding the publication of this study.

References

Chiotaki, D., Poulopoulos, V., & Karpouzis, K. (2023). Adaptive game-based learning in education: a systematic review. *Frontiers in Computer Science*, *5*(2016). https://doi.org/10.3389/fcomp.2023.1062350

Farichah, L. (2012). Self-Regulated Learning 1.1.

JASMINE, K. (2014). 済無No Title No Title No Title. *The addition of sodium benzoate and potassium sorbate (anti-inversion) and stirring speed as an effort to inhibit inversion reactions in sugarcane sap*, 11–48.

Li, X., Xia, Q., Chu, S. K. W., & Yang, Y. (2022). Using Gamification to Facilitate Students' Self-Regulation in E-Learning: A Case Study on Students' L2 English Learning. *Sustainability (Switzerland)*, *14*(12), 1–16. https://doi.org/10.3390/su14127008

Maulidina, M., Susilaningsih, S., & Abidin, Z. (2018). Development of Game Based Learning Based on Scientific Approach in Grade IV Elementary School Students. *JINOTEP (Journal of Learning Innovation and Technology) Studies and Research in Learning Technology*, *4*(2), 113–118. https://doi.org/10.17977/um031v4i22018p113

Nurdin, A. J., Rejekiningsih, T., & Sumaryati, S. (2023). Facilitating Self-regulated Learning Using Mobile Learning Games. *International Journal of Information and Education Technology*, *13*(11), 1820–1827. https://doi.org/10.18178/ijiet.2023.13.11.1994

Nurhasanah, A., & Hamidah, R. (2024). The Benefits of Game Based Learning in

Increasing Student Activity in Fiqh Subjects Grade VIII SMP Plus Bina Pandu Mandiri, *2*(2), 23–31.

Sidiq, N. A., & Magistarina, E. (2024). The Relationship of Self-Regulated Learning with Academic Procrastination in Students Who Are Preparing Their Thesis at Padang State University. *Edu Sociata (Journal of Sociology Education), 7*(1), 156–161. https://doi.org/10.33627/es.v7i1.1975

Chu, S. T., Hwang, G. J., Chien, S. Y., & Chang, S. C. (2023). Incorporating teacher intelligence into digital games: An expert system-guided self-regulated learning approach to promoting EFL students' performance in digital gaming contexts.*British Journal of Educational Technology*,*54*(2), 534-553.

Creswell, J. W., & Poth, C. N. (2016). Qualitative inquiry and research design: Choosing among five approaches. Wise publications.

Patton, M. Q. (2015). Qualitative Research and Evaluation methods, 4th edn. (Thousand Oaks; London.