International Journal of Science and Research Archive

eISSN: 2582-8185

Cross Ref DOI: 10.30574/ijsra

Journal homepage: https://ijsra.net/

(RESEARCH ARTICLE)

Check for updates

The role of game-based learning in enhancing student learning motivation

Ronny Trian Surbakti *

Vocational Program, Parahyangan Catholic University, Indonesia.

International Journal of Science and Research Archive, 2025, 15(01), 333-339

Publication history: Received on 25 February 2025; revised on 05 April 2025; accepted on 07 April 2025

Article DOI: https://doi.org/10.30574/ijsra.2025.15.1.1013

Abstract

This paper explores the role of Game-Based Learning (GBL)) in enhancing student motivation within educational processes. The research synthesizes current findings and provides insights into how Game Based Learning can be effectively implemented to improve student engagement and learning outcomes. In this research, it was found that, in practical application and supported by empirical evidence, it can be stated that Game Based Learning can foster significant learning motivation, this is supported by the results of data processing using SmartPLS.. Theoretical underpinnings, useful implementations, and empirical data in favor of game-based learning are covered, and suggestions for educators and legislators are made at the conclusion. The research highlights how game-based learning may help students develop self-motivation, self-reliance, and a desire to improve, making it an important tool in contemporary education.

Keywords: Game Based Learning; Student learning motivation; Education, Motivation

1. Introduction

Today's modern education, especially in education in the digital era, many students are getting closer and more involved with technology and even with game approaches in supporting learning (Jayalath & Esichaikul, 2020). Many education experts agree that a game-based approach in improving the quality of learning is more effective and achieves learning goals (Esreyel et.al, 2014). Game elements contained in a game (game) and integrated in learning, have the potential to make education interesting and more interactive and this can help students develop their skills such as teamwork, problem solving and decision making (Vlacopoulos & Makri, 2017). The integration of Game Based Learning which can be used as a forum for increasing student learning motivation in the current digital era has been proven to provide an in-depth learning experience and not forget the fun side of a game (Randel et al., 1992). Using educational content in a game scenario, learning ill become more fun and the material provided to students will also become more attractive and easy to understand, increasing positive attitudes towards learning will also encourage the development of students' mindsets who are willing to take risks and learning that supports the development of students' competencies. (Eseryel et al., 2014).

A more profound comprehension of the subject matter and a greater memory retention rate may result from this experiential method. Gamification features like awards, stages, and tasks can also give students an overall feeling of growth and success, which is another reason for them to take an active role in gaining knowledge. (Baah et al., 2023) Educators are realising that game-based learning may transform classroom practices and help students thrive in the digital era by encouraging them to take an active role in their own education.

* Corresponding author: Ronny Trian Surbakti

2. Literature Review

2.1. Game Based Learning

A lot of study has been done on game-based learning because it has the capacity to get students more interested and motivated in their educational journey (Jayalath & Esichaikul, 2020). The notion of "learning by doing" was studied using video games, emphasizing the comprehensive and participatory element of game-based learning, which promotes engagement and interactive learning. In a similar vein, Squire highlighted how game-based learning helps students retain and get a deeper comprehension of the material by letting them use it in real-world contexts. (Covaci et al., 2018).

It has been discovered that gamification components like obstacles and prizes have a beneficial effect on students' enthusiasm and feeling of accomplishment, which in turn encourages active engagement in class (Rivera & Garden, 2021). Additionally, game-based learning may foster 21stcentury abilities like analytical thinking, figuring out solutions, and teamwork. (Qian & Clark, 2016). According to Salen and Zimmerman, game-based learning fosters the mindset of growth in students by encouraging them to engage with challenges, persevere in regardless of setbacks, and promoting a resilient approach to knowledge and skill advancement (Kaya et al, 2022).

2.2. Student Learning Motivation

Educational psychology and research have shown a tremendous deal of interest in the issue of how students are learning enthusiasm (Saleh et al., 2023). More engaged in educational endeavors, able to overcome obstacles, and producing superior academic results are characteristics of motivated pupils (Han & Yin, 2016).

When developing effective environments for learning with innovative teaching methods, educators must have a thorough understanding of the elements that drive the interest of students. When developing effective environments for learning with innovative teaching methods, educators must have a thorough understanding of the elements that drive the interest of students (Maclellan, 2008). By giving students a feeling of their intended purpose, self-determination, and mastery chances, game-based learning has been demonstrated to boost the internal drive in students (Eseryel et al., 2014). With the help of incorporating game-based learning into the education system, teachers may capitalize on students' innate curiosity and need for challenge, which will boost their engagement and pleasure of the learning process.

Additionally, the significance of independent thought in the context of motivation is immeasurable. Using game mechanics, students are given more agency in their learning by allowing them to make decisions, find solutions, and investigate course material in ways that resonate with them. This autonomy has been connected to better levels of drive and involvement because it makes students feel like they are in charge of their own learning.

An additional important variable influencing student desire to study is the value of their learning assignments. Learning through games has the potential to increase its perceived value by capitalizing on the engaging and entertaining aspects of games. Students' self- motivation is enhanced when they believe that the learning activities are relevant and pleasurable, which motivates them to put in more effort and perseverance to finish the assignments. (Rivera & Garden, 2021).

Incorporating game-based learning into education may significantly boost students' internal drive, independence, perceived importance of tasks, and social motivation. This, in turn, leads to a more captivating and satisfying experience of learning for students (Jayalath & Esichaikul, 2020).

3. Methods

3.1. Research Design

This study employs a quantitative survey design. This design is chosen because it allows for the collection of data from a large sample, making the results generalizable to a broader population. The study will involve students from several schools that incorporate game-based learning into their educational process.

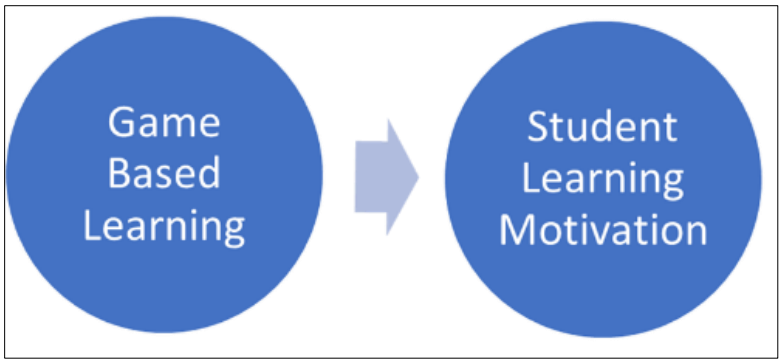

Figure 1 Research model

3.2. Population and Sample

The population for this study consists of 61 vocational students (university) who have been exposed to game-based learning, using slovin formula the sampling of this research was 53 respondent.

The methodology for data collection in this study involves administering surveys through structured questionnaires, specifically designed to capture data on each variable's impact. This study uses basic linear regression to explore the connection between the classifier (independent variable) and the outcome (dependent variable). In order to guarantee precise processing and insights, the acquired data will be examined using the SmartPLS software.

4. Results and Discussion

The review of the literature in this research shows that game-based learning may revolutionize conventional teaching techniques and enable learners to become more independent and passionate learners in today's technological world. The review results suggest that game-based learning improves students' enthusiasm for and participation in the learning process, while also promoting the growth of ability to think critically, solve problems, and teamwork skills that are crucial for 21st-century competences. Research also shows that students' personal drives, perceived task worth, self-determination, and social motivation are all positively affected by game-based learning. Game-based learning has been shown to leverage students' inherent need for challenge and curiosity by offering autonomy, possibilities for mastery, and a feeling of purpose.

This results in heightened interest and satisfaction in the learning process. Moreover, the engaging and interactive characteristics of game-based learning amplify the perceived worth of education, strengthen internal drive, and inspire students to persevere in the face of difficulties. The methods of analysis implemented in this research are intended to precisely quantify the impact of game-based learning on the motivation of students to learn. The selected quantitative survey approach is to gather information regarding an extensive population of secondary school students who have experienced game-based learning, with the intention of making the findings applicable to a wider community.

Objective measuring methods like surveys and exams allow statistical analysis of data to determine how game-based learning affects the motivation of students. Since this study advances, it is crucial to further investigate the precise processes by which game-based learning impacts student motivation. By undertaking more research and gathering actual information from a varied representative sample student, this study can enhance the information of the consequences of game-based learning for the context of education.

Furthermore, investigating the results of game based learning in various educational settings might offer significant observations on its wide-ranging applicability and efficacy in promoting student enthusiasm and involvement. Ultimately, the results of this research have the potential to make a substantial contribution to the current knowledge on game-based learning and its influence on student motivation.

This, in turn, may inspire the creation of successful instructional techniques and learning environments. Continued study in this field will further enhance our comprehension of the possibilities and constraints of game-based learning, eventually benefiting teachers, learners, and educational establishments. Using this calculation, we may be assured that the sample is indeed equivalent to the full population. In terms of Slovin's formula, here it is:

$$n = \frac{N}{1 + N(e)^2}$$

Where:

- n = required sample size
- N = population size
- e = margin of error (usually expressed as a percentage, for example 0.05 to 5%)

$$n = \frac{N}{1 + N(e)^2}$$

Population size (N) = 61

Margin of error (e) = 0.05

Calculation Steps

N=61

- e = 0.05
- e =0.05 into the formula
- n = 53 sample respondents

Table 1 Cronbach Alpha, rho A, Composite Reliability Average Variance Extracted (AVE)

	Cronbach's Alpha	**rho_A**	**Composite Reliability**	**Average Variance Extracted (AVE)**
GBL	0.936	0.938	0.954	0.839
SLM	0.971	0.972	0.981	0.946

Each of them Game Based Learning and Student Learning Motivation demonstrate exceptional reliability as well as validity in this study. This indicates that the instruments used to assess these ideas exhibit a high level of reliability and precision.

Table 2 Outer Loading

	GBL	SLM
x1	0.945	
x2	0.892	
x3	0.888	
x4	0.938	
y1		0.977
y2		0.975
y3		0.965

The indices for Game Based Learning (GBL) and Student Learning Motivation (SLM) are all strong, suggesting they are credible and precise. The parameters used for game-based learning (x1, x2, x3, x4) demonstrate high dependability, with values beyond 0.88.

Extremely high levels of measurement reliability are shown by the SLM indicators (y1, y2, y3), which are all greater than 0.96. In summary, the findings indicate that the instruments employed to assess Game Based Learning and Student Learning Motivation exhibit a high degree of reliability and validity.

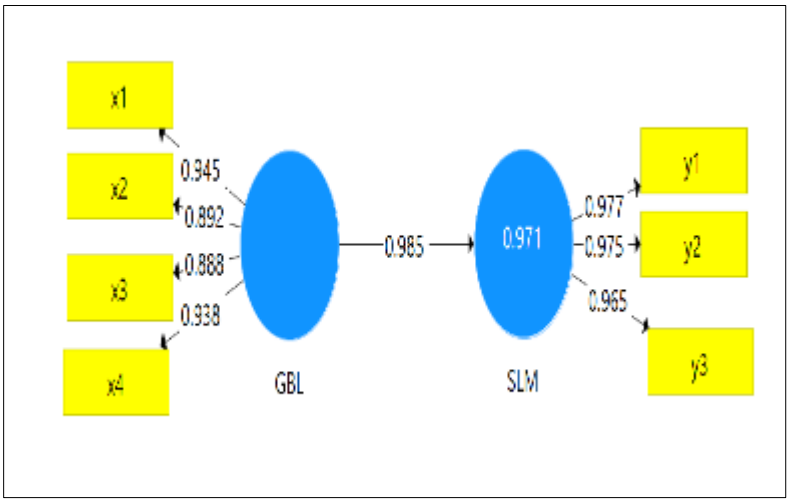

Figure 2 Research result model

The structural equation modeling carried out via SmartPLS 3 showcases a well-defined and convincing relationship model, demonstrating how Game-Based Learning considerably affects the motivation levels in student learning. The notable robustness of the indicators for the respective constructs points to the trustworthiness of the instruments used for measurement. Additionally, the emphatic path coefficient emphasizes the meaningful influence that Game-Based Learning exerts on Student Learning Motivation. Based on these results, game-based learning approaches should be finetuned to greatly increase student participation and passion in the classroom.

5. Conclusion

Game-based learning is a potential method for increasing students' interest and involvement in the educational process. The study's methodology and literature evaluation have shed important light on how game-based learning may transform conventional teaching strategies and give students more authority in the digital world.

The positive impact of game based learning on students' intrinsic motivation, autonomy, perceived task value, and social motivation has been underscored, highlighting its ability to tap into students' natural inclination for challenge and curiosity. Game-based learning enhances students' educational experience by promoting autonomy, possibilities for mastery, and a feeling of purpose, resulting in heightened interest and enjoyment in the learning process.

Furthermore, the immersive and interactive nature of Game Based Learning enhances the perceived value of learning, bolsters intrinsic motivation, and encourages students to persist through challenges. The quantitative survey approach was used to properly quantify the impact of game-based learning on the motivation of students to learn, offering insights that might enhance instructional tactics and learning settings.

Additional inquiry into the precise mechanisms by which game-based learning impacts the interest of students will be imperative as this research advances. An expanded examination and systematic gathering of actual information from a heterogeneous sample of students may enhance the overall comprehension of the ramifications that game-based learning has on the field of learning. Further investigation into the results of game-based learning implemented in various educational settings can yield significant knowledge regarding its multifaceted uses and efficacy in cultivating student enthusiasm and participation.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

References

[1] A. Adukaite, I. van Zyl, Ş. Er, and L. Cantoni, "Teacher perceptions on the use of digital gamified learning in tourism education: The case of South African secondary schools," *Comput. Educ.*, vol. 111, pp. 172–190, Apr. 2017. Available: https://doi.org/10.1016/j.compedu.2017.04.008.

[2] A. Covaci, G. Ghinea, C. Lin, S. W. Huang, and J. Shih, "Multisensory games-based learning - lessons learnt from olfactory enhancement of a digital board game," Jan. 6, 2018. Available: https://doi.org/10.1007/s11042-017-5459-2.

[3] D. Eseryel, V. Law, D. Ifenthaler, X. Ge, and R. B. Miller, "An investigation of the interrelationships between motivation, engagement, and complex problem solving in game-based learning," Jan. 1, 2014. Available: http://dro.deakin.edu.au/eserv/DU:30060688/ifenthaler-investigation-2014.pdf.

[4] J. M. Randel, B. A. Morris, C. Wetzel, and B. V. Whitehill, "The effectiveness of games for educational purposes: A review of recent research," *Simul. Gaming*, vol. 23, no. 3, pp. 261–276, Sep. 1992. Available: https://doi.org/10.1177/1046878192233001.

[5] N. S. Saleh, S. A. Taib, N. Sa'adan, M. Noorezam, S. M. M. Iliyas, N. Jenal, and N. H. Rahmat, "Learning motivation: A correlational study between value and expectancy components," *Int. J. Acad. Res. Bus. Soc. Sci.*, vol. 13, no. 6, Jun. 2023. Available: https://doi.org/10.6007/ijarbss/v13-i6/17112.

[6] Z. Zainuddin, S. K. W. Chu, M. Shujahat, and C. J. Perera, "The impact of gamification on learning and instruction: A systematic review of empirical evidence," *Educ. Res. Rev.*, vol. 30, 2020, 100326. Available: https://doi.org/10.1016/j.edurev.2020.100326.

[7] E. Kyewski and N. C. Krämer, "To gamify or not to gamify? An experimental field study of the influence of badges on motivation, activity, and performance in an online learning course," *Comput. Educ.*, vol. 118, pp. 25–37, Mar. 2018. Available: https://doi.org/10.1016/j.compedu.2017.11.006.

[8] E. Maclellan, "The significance of motivation in student-centred learning: A reflective case study," *Teach. High. Educ.*, vol. 13, no. 5, pp. 511–524, Aug. 2008. Available: https://doi.org/10.1080/13562510802169681.

[9] A. All, E. P. N. Castellar, and J. V. Looy, "Assessing the effectiveness of digital game-based learning: Best practices," *Comput. Educ.*, vol. 92-93, pp. 90–103, Jan. 2016. Available: https://doi.org/10.1016/j.compedu.2015.10.007.

[10] J. Han and H. Yin, "Teacher motivation: Definition, research development and implications for teachers," *Cogent Educ.*, vol. 3, 2016. Available: https://doi.org/10.1080/2331186x.2016.1217819.

[11] M. Qian and K. Clark, "Game-based learning and 21st century skills: A review of recent research," *Comput. Hum. Behav.*, vol. 63, pp. 50–58, Oct. 2016. Available: https://doi.org/10.1016/j.chb.2016.05.023.

[12] D. Vlachopoulos and A. Makri, "The effect of games and simulations on higher education: A systematic literature review," *Int. J. Educ. Technol. High. Educ.*, vol. 14, 2017. Available: https://doi.org/10.1186/s41239-017-0062-1.

[13] J. Jayalath and V. Esichaikul, "Gamification to enhance motivation and engagement in blended eLearning for technical and vocational education and training," *Educ. Inf. Technol.*, vol. 25, pp. 1911–1934, Aug. 2020. Available: https://doi.org/10.1007/s10758-020-09466-2.

[14] E. Rivera and C. L. P. Garden, "Gamification for student engagement: A framework," *J. Furth. High. Educ.*, vol. 45, no. 3, pp. 289–305, Feb. 2021. Available: https://doi.org/10.1080/0309877x.2021.1875201.

[15] S. Kaya, D. Yüksel, and S. Curle, "The effects of language learning and math mindsets on academic success in an engineering program," *J. Eng. Educ.*, vol. 111, no. 1, pp. 81–100, Dec. 2022. Available: https://doi.org/10.1002/jee.20499.

[16] C. Baah, I. Govender, and P. R. Subramaniam, "Exploring the role of gamification in motivating students to learn," *Cogent Educ.*, vol. 10, no. 1, May 2023. Available: https://doi.org/10.1080/2331186x.2023.2210045.

[17] M. S. Alotaibi, "Game-based learning in early childhood education: A systematic review and meta-analysis," *Front. Psychol.*, vol. 15, Apr. 2024. Available: https://doi.org/10.3389/fpsyg.2024.1307881.

[18] G. Barata, S. Gama, J. Jorge, and D. Gonçalves, "Studying student differentiation in gamified education: A long-term study," *Comput. Hum. Behav.*, vol. 71, pp. 550–585, Jun. 2017. Available: https://doi.org/10.1016/j.chb.2016.08.049.

[19] A. Rapp, “Designing interactive systems through a game lens: An ethnographic approach,” *Comput. Hum. Behav.*, vol. 71, pp. 455–468, Jun. 2017. Available: https://doi.org/10.1016/j.chb.2015.02.048.

[20] L. H. Quek et al., “Educational escape rooms for healthcare students: A systematic review,” *Nurse Educ. Today*, vol. 132, 2024, 106004. Available: https://doi.org/10.1016/j.nedt.2023.106004.

[21] V. R. Smith and P. A. Paul, “Escape room: innovative teaching strategy to stimulate critical thinking/judgment in nursing students,” *Nurs. Educ. Perspect.*, vol. 42, no. 6, pp. E154–E155, 2021. Available: https://doi.org/10.1097/01.NEP.0000000000000700.

[22] R. H. Stupnisky, A. BrckaLorenz, B. Yuhas, and F. Guay, “Faculty members’ motivation for teaching and best practices: Testing a model based on self-determination theory across institution types,” *Contemp. Educ. Psychol.*, vol. 53, pp. 15–26, Jan. 2018. Available: https://doi.org/10.1016/j.cedpsych.2018.01.004.

[23] A.-C. E. Ding and C.-H. Yu, “Serious game-based learning and learning by making games: Types of game-based pedagogies and student gaming hours impact students' science learning outcomes,” *Comput. Educ.*, 2024, 105075. Available: https://doi.org/10.1016/j.compedu.2024.105075.

[24] J. Robertson, “Making games in the classroom: Benefits and gender concerns,” *Comput. Educ.*, vol. 59, no. 2, pp. 385–398, Sep. 2012. Available: https://doi.org/10.1016/j.compedu.2011.12.020.

[25] R. M. Ryan and E. L. Deci, “Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions.