

The Use of Game-Based Learning to Improve Students' Motivation and Learning Outcomes

Faisal Amri¹, Arso Setyaji², Priharyanti³

¹Pendidikan Bahasa Inggris, Pendidikan Profesi Guru, Universitas PGRI Semarang, Jl. Sidodadi Timur No. 24 Kota Semarang, 50232

²Pendidikan Bahasa Inggris, FPBS, Universitas PGRI Semarang, Jl. Sidodadi Timur No. 24 Kota Semarang, 50232

³SMA Negeri 11 Semarang, Jl. Lamper Tengah XIV RT 01 RW 01, Semarang Selatan, Kota Semarang, 50248

E-mail: fslamrie@gmail.com

ABSTRAK

Penelitian ini menginvestigasi penggunaan Game-Based Learning (GBL) sebagai metode dalam meningkatkan motivasi dan hasil belajar siswa di kelas XI D-1. Penelitian ini menggunakan metode Penelitian Tindakan Kelas (PTK) sebagai kerangka kerjanya. Penelitian ini dilakukan di SMA Negeri 11 Semarang. Melalui serangkaian siklus PTK, peneliti menerapkan GBL dalam pembelajaran di kelas XI D-1. Data yang diperoleh meliputi hasil tes dan observasi kelas. Hasil penelitian menunjukkan bahwa penggunaan GBL secara signifikan meningkatkan tingkat motivasi siswa dalam pembelajaran. Siswa menunjukkan minat yang lebih tinggi terhadap materi pelajaran, serta lebih aktif berpartisipasi dalam proses pembelajaran. Selain itu, hasil belajar siswa juga mengalami peningkatan yang signifikan, dengan peningkatan skor tes yang mencerminkan pemahaman yang lebih baik terhadap materi pelajaran. Temuan ini mendukung penggunaan GBL sebagai metode pembelajaran yang efektif dalam meningkatkan motivasi dan hasil belajar siswa di kelas XI D-1, dengan implikasi positif terhadap perbaikan kualitas pendidikan.

Kata kunci: pembelajaran berbasis permainan, motivasi, hasil belajar

ABSTRACT

This research investigated the use of Game-Based Learning (GBL) as a method for increasing student motivation and learning outcomes in class XI D-1. This research uses the Classroom Action Research (CAR) method as its framework. This research was conducted at SMA Negeri 11 Semarang. Through a series of CAR cycles, researchers applied GBL in learning in class XI D-1. The data obtained included test results and classroom observations. The research results showed that the use of GBL significantly increased students' level of motivation in learning. Students showed higher interest in the subject matter, and participate more actively in the learning process. In addition, student learning outcomes also experienced significant improvements, with increased test scores reflecting better understanding of the subject matter. These findings supported the use of GBL as an effective learning method in increasing student motivation and learning outcomes in class XI D-1, with positive implications for improving the quality of education.

Keywords: game based-learning, motivation, learning outcomes

1. INTRODUCTION

Education as a fundamental pillar in the development of a nation carries the responsibility to prepare the younger generation with the knowledge, skills and values needed to face the demands of the times. However, in recent decades, challenges have increased due to rapid

changes in information technology and culture. Today's students grow up in an environment rich in information, entertainment, and digital interactions, which directly influences the way they interact with knowledge and learn. Traditional learning which tends to focus on one-way exposure from teacher to

student with little active involvement of students is increasingly experiencing obstacles in generating student interest and motivation. One aspect that is the main focus in the world of education is student motivation. Motivation is a key factor that influences the extent to which students are involved in the learning process and how much effort they make to achieve educational goals. High motivation can stimulate students' interest in learning, encourage active participation, and produce better learning outcomes (Hsieh 2014).

Student motivation is an essential element in an effective learning process. In the world of education, motivation is the driving force that moves students to be involved in learning, participate actively in the learning process, and achieve better results. A deep understanding of the importance of student motivation is key in designing successful learning strategies and maximizing student potential. First of all, student motivation influences the level of engagement in the learning process (Tsai et al. 2017).

Motivated students tend to be more active, focused, and participate in learning activities. They are more open to understanding and absorbing subject matter, which ultimately results in deeper learning. Apart from that, student motivation also has a direct impact on learning outcomes. Motivated students have a tendency to achieve better results in assignments and exams. High motivation stimulates greater effort and a willingness to overcome learning challenges. Conversely, a lack of motivation can hinder students' academic achievement and reduce their ability to reach their full potential. Student motivation also plays an important role in building sustainable interest in learning. Students who feel motivated have a tendency to remain curious, explore topics more deeply, and expand their understanding beyond the scope of the classroom. This creates lifelong learning, which in turn supports ongoing intellectual and personal development. In addition, the importance of student motivation is also related to school success and student retention. Motivated students

tend to be more committed to the learning process and are more likely to complete their education. Strong motivation can help students overcome obstacles and barriers they may face during their educational journey (Su 2016).

Although important, student motivation is often a challenge for educators. Each student has a different motivation profile, and the factors that influence motivation can vary. Therefore, a deep understanding of motivation theories and strategies to stimulate and maintain student motivation is essential for educators to create meaningful and effective learning experiences. Moreover, in an era of increasingly diverse education and continuously developing technology, understanding how to integrate technology, such as Game Based Learning (GBL), to increase student motivation is becoming increasingly important to apply in the context of modern education (Denham, Mayben, and Boman 2016).

The development of information and communication technology (ICT) has brought major changes to the world of education. One significant development is the use of Game Based Learning (GBL) or game-based learning in the learning process. GBL incorporates game elements in the learning environment to increase student engagement. GBL offers a more interactive and engaging approach, which suits the characteristics of the younger generation who grew up with technology (Li and Tsai 2013). Games have the ability to generate student interest, engagement, and motivation, while presenting challenges that can stimulate cooperation, problem solving, and critical thinking. Interest in GBL has grown rapidly among educators and researchers. GBL has been applied in various educational contexts, from elementary to tertiary levels. Through the use of game elements such as competition, challenges, narration, and awards, GBL aims to create a more enjoyable and meaningful learning experience (Wang and Zheng 2021).

However, despite its great potential, the application of GBL in learning still faces a number of challenges and questions. One of them is the extent to which GBL can

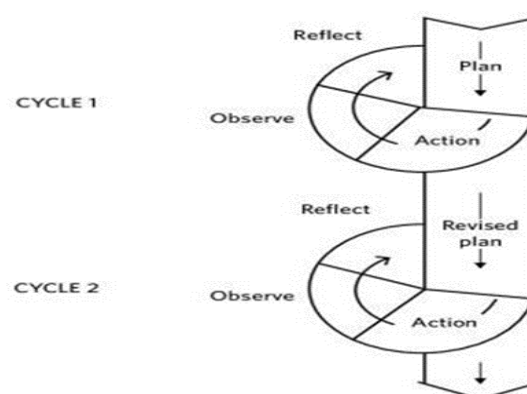
effectively increase student motivation and their learning outcomes. Therefore, this action research will bridge this knowledge gap by investigating the impact of implementing GBL in improving student motivation and learning outcomes. This research also emerged as a response to fundamental changes in learning paradigms, which are increasingly moving towards more interactive and student-centered approaches. By understanding how GBL can influence student motivation and learning outcomes, this research seeks to make an important contribution to the development of more adaptive and effective education in this digital era.

2. RESEARCH METHOD

The research method used in this research is Classroom Action Research (CAR). Classroom Action Research (CAR) is research conducted by teachers or researchers as an action to improve and improve educational services in handling the teaching and learning process which has targets or research subjects, namely students (Bleicher 2014). Through the use of classroom action research, teachers can continue to improve their performance, by carrying out self-reflection, namely efforts to identify weaknesses in the learning process they carry out, then plan for the improvement process and implement improvement processes in the learning process in accordance with the learning program that has been implemented. compiled and ended with reflection (Syah 2016). CAR is defined as a problem-solving strategy that utilizes real action and the process of developing capabilities in detecting and resolving problems. Therefore, it can be concluded that classroom action research (CAR) is research as an effort to identify a problem or weakness in the learning process by making improvements in the learning process (Meesuk, Sramoon, and Wongruga 2020).

The data in this research are quantitative and qualitative data. Quantitative data is obtained from student scores consisting of pre-test and post-test, while qualitative data is a description of the

learning process during the implementation of the action. This classroom action research uses the Kemmis & Mc Taggart model. Kemmis & Mc Taggart's action research model consists of four components, namely planning, acting, observing and reflecting. These four components are seen as a cycle. The acting (action) component with observing (observation) is made into a single unit where both activities must be carried out at one time, once an action takes place, observation must also be carried out (Meesuk et al. 2020). The research procedure can be seen in the following picture.



Picture 1. Research Cycle

The data obtained from this research is data regarding how Game-Based Learning is implemented in English learning as well as student motivation and students' outcomes. The data collection techniques used to collect data in this research are observation which consist of 15 statements from 8 indicators of student motivation, and test which consist of 20 items.

Validity and reliability of research instruments are two key aspects in ensuring the quality and reliability of the data collected (Heale and Twycross 2015). In this research, researchers used statistical analysis using SPSS version 25 software, the validity of the instrument is often measured using Pearson Product Moment. The results of this analysis help determine the extent to which the instrument actually measures what it is supposed to measure, so that the results obtained can be trusted. Meanwhile, the reliability of the instrument

is measured using Cronbach's Alpha, which measures the internal consistency of the instrument. By calculating Cronbach's Alpha, researchers can assess the extent to which the instrument provides consistent results when tested on the same subjects under different conditions. Therefore, the use of SPSS in measuring the validity and reliability of instruments is an important step in ensuring that the data obtained in research is of high quality and reliability (Anggraini et al. 2022).

This research combines qualitative and quantitative approaches in data analysis. In quantitative data analysis, researchers used the mean method, which refers to the average student test scores. In this case, the average score is calculated by adding up all student scores and then dividing by the number of students in the class. Following is the calculation formula:

$$\bar{X} = \frac{\sum X}{N}$$

Description:

\bar{X} : Mean

$\sum x$: Total scores

N : Numbers of students

Meanwhile, qualitative data is obtained through direct observation of a situation or phenomenon, in this case class XI D-1. In this data collection process, observers actively observe behavior, interactions, or events that occur in the classroom directly (real-time).

$$\frac{x}{n} \times 100\%$$

Description:

x : value

n : total value

After calculating the obtained value (percent) for each indicator, then the values are grouped based on value categories. Researchers use assessment categories based on the following percentage value scale:

Table 1. Levels of Motivation

81 – 100%	Very Strong Motivatioin
61 – 80%	Strong Motivation
41 – 60%	Moderate Motivation
21 – 40%	Weak Motivation
0 – 20%	Very Weak Motivation

3. FINDINGS AND DISCUSSION

Prior to conducting the cycle of learning plan, the researcher calculated the validity and reliability of the instruments. The result of test validity and reliability of the instruments (test, observation sheet) used in this research, which were calculated by SPSS version 25, were presented as follows:

Table 2. Result of Validity test

Item	Question Number
Valid	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20
Invalid	-

Based on the table above showed, all questions (1-20) used as a test were valid. Since the calculated r value for each question item with the table r value (N=20-2), looking for the distribution of the table r values at 5% significance, then obtained a table r value of 0.631. Because the calculated r value was > 0.631 (r table), it can concluded that the test instrument was declared valid as a data collection tool in research.

Table 3. Result of Reliability test

Reliability Statistics	
Cronbach's	
Alpha	N of Items
.959	20

Based on the output above, it is known that the Cronbach's Alpha value is 0.959. Then the researcher compared this value with the r table value (N=20-2), looking for the distribution of r table values at a significance of 5%, then obtained an r table value of 0.443. Because the Cronbach's Alpha value was > 0.443 (r table), it can be concluded that the test instrument was declared reliable as a data collection tool in research.

After knowing the result of validity and reliability of instruments, then the researcher used the instrument to measure students' initial abilities, researchers used a pre-test before being given treatment using Game-Based Learning. The pretest held on July 31 2023. Students are asked to do pretest about Stating Opinion and Caption as the material. The purpose of the pre-test is to determine students' initial abilities regarding Stating Opinion and Caption before being given treatment. The results of the student pre-test can be seen in the following table:

Table 4. Result of Pre-test

Category	Range scores	Total	Percent age (%)	Mean
Bagus sekali	87 - 100	0	0	
Sangat bagus	75 - 86	9	25,00	
Bagus	61 - 74	6	16,66	
Cukup	47 - 60	12	33,33	58,75 (Cukup)
Kurang	34 - 46	7	19,44	
Sangat Kurang	< 34	2	5,55	

From the pre-test results, 36 student of class XI D-1, the average student score was 58.75. The number of students who obtained a KKM completion score of was 9 students or it could be interpreted that only 25% of students completed it. Meanwhile, there were more students who did not complete than students who completed the KKM, namely 27 students or 75% of students. After the problem is identified, the researcher analyzes the problem and consults with teachers and colleagues. It can be said that the value of student learning outcomes is still relatively low.

After analyzing the pre-test results in the pre-cycle, the researcher then made a learning plan using game-based learning which was planned to be carried out in 2 learning cycles. Each cycle consists of 2 meetings with a post-test at each second

meeting as an evaluation of learning outcomes to see the progress experienced by students. In implementing the cycle, researchers also use observation sheets to assess activities carried out by students in the classroom. The observation sheet used is to see student motivation during the learning process in the classroom.

First meeting of cycle 1, Monday 31 July 2023, the researcher conducted the learning plan by giving the treatment, game-based learning, to the students of XI D-1 while observed the students using observation sheet. On the second meeting of cycle 1, Monday 7 August 2023, the researcher did the post-test 1 to the students to see the result of treatment as an evaluation and to see the students' comprehension of the materials given. The result of post-test 1 as follows:

Table 5. Result of Post-test 1

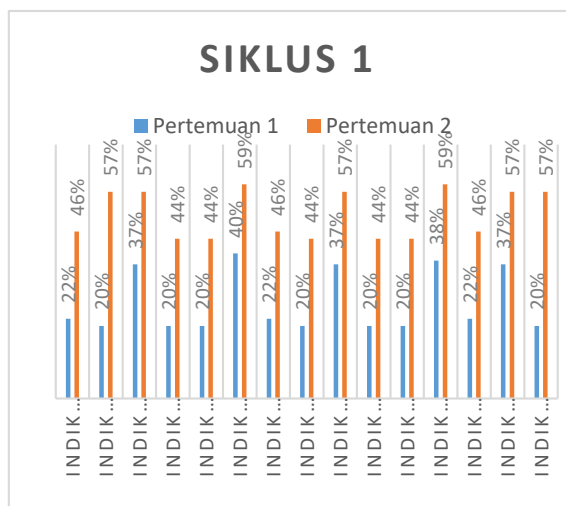
Category	Range scores	Total	Percent age (%)	Mean
Bagus sekali	87 - 100	8	22,22	
Sangat bagus	75 - 86	13	36,11	
Bagus	61 - 74	6	16,66	
Cukup	47 - 60	8	22,22	74,86 (Bagus)
Kurang	34 - 46	1	2,77	
Sangat Kurang	< 34	0	0	

As the post-test 1 results, 36 students of class XI D-1, the average student score was 74.86. The number of students who obtained a KKM completion score was 21 students or it could be interpreted that only 58% of students completed it. Meanwhile, there were students who did not complete the KKM, namely 15 students or 42% of students. It can be said that the students who got scores below KKM almost a half of all students in XI D-1 class. It meant that the students' learning outcomes was still relatively moderate.

During the proses of learning the researcher and observer did observation to

see the activities of students. Below was the result of observation about students' motivation in the cycle 1 which consisted of two meetings. The result was shown as follows:

Picture 2. Result of Observation 1



The result of observation showed that there were improvements on the students' motivation from first meeting to second meeting. As the red graphics were higher than the blue ones. It indicated and showed that all indicators of motivation were improved even though all the improvements were below 60% (moderate motivation).

Regarding the low improvement both post-test 1 and observation result in cycle 1, then the researcher carried out cycle 2 after did reflection and revised the learning plan for cycle 2.

Third meeting of cycle 2, Monday 21 August 2023, the researcher conducted the learning plan by giving the treatment, game-based learning, to the students of XI D-1 while observed the students using observation sheet. On the fourth meeting of cycle 2, Monday 28 August, the researcher did the post-test 1 to the students to see the result of treatment as an evaluation and to see the students' comprehension of the materials given. The result of post-test 1 as follows:

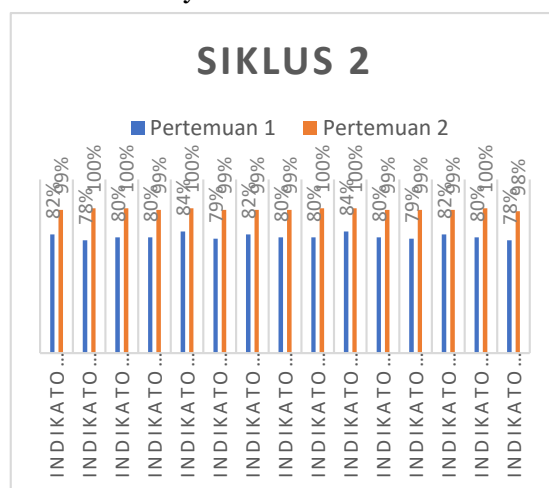
Table 6. Result of Post-test 2

Category	Range scores	Total	Percent age (%)	Mean age
----------	--------------	-------	-----------------	----------

Bagus sekali	87 - 100	23	63,88	
Sangat bagus	75 - 86	9	25,00	
Bagus	61 - 74	4	11,11	89,08 (Bagus Sekali)
Cukup	47 - 60	0	0	
Kurang	34 - 46	0	0	
Sangat Kurang	< 34	0	0	

As the post-test 2 results, 36 students of class XI D-1, the average student score was 89.08. The number of students who obtained a KKM completion score of was 32 students or it could be interpreted that 89% of students completed it. Meanwhile, there were few students who did not complete the KKM, namely 4 students or 11% of students. It can be said that almost all students got KKM score and above, and only few students got below KKM score. It can be concluded that the students learning outcomes is high.

As it was supported from the result of observation cycle 2 which consisted of two meetings (third meeting and fourth meeting). Following was the result of observation cycle 2:



Picture 3. Result of Observation 2

The result of observation of cycle 2 showed that there were improvements on the students' motivation from third meeting to fourth meeting. As the red graphics were higher than the blue ones. It indicated and showed that all indicators of motivation were almost all indicators 100% or highly improved (very strong motivation).

From the results of both test (post-test 1, posttest 2, observation 1, observation 2) showed progressive improvements on the students of XI D-1 using game-based learning as the treatment to the students. While they played and also learnt at the same time made them felt fun and excited during the process of learning.

Game-Based Learning (GBL) is an approach that has been proven effective in increasing student motivation and learning outcomes. In a learning context, GBL offers interesting elements such as challenge, competition, and emotional involvement, which significantly increase students' interest in learning material. GBL creates a fun learning experience, making students feel that they are playing rather than just learning. In addition, through GBL, students are actively involved in the learning process, solving problems, making decisions, and getting instant feedback. This helps them understand concepts in more depth and improves their learning outcomes. Therefore, GBL has great potential in creating a more dynamic, interesting and effective learning environment, which can produce high motivation and better learning outcomes.

4. CONCLUSION

Game-Based Learning (GBL) has been proven to be an effective tool in increasing student motivation in educational contexts. By presenting elements such as challenge, competition, and emotional involvement, GBL stimulates students' interest in learning. GBL creates a fun and interesting learning experience, making the learning process more meaningful. It also helps in bridging the gap between theory and practice, as GBL often involves real-world situations that spark students' curiosity. Through active interaction in the game, students can feel a sense of accomplishment as they overcome challenges, which has a positive impact on their motivation to learn.

Apart from increasing motivation, the use of GBL also has a significant positive impact on student learning outcomes. GBL allows students to actively engage in learning, solve problems, and make

decisions in a safe environment. This allows them to understand the concept in more depth. GBL also provides instant feedback, helping students understand their mistakes and improve their performance over time. These enhanced learning outcomes result in stronger understanding and better skills in applying knowledge in real-life contexts. Thus, GBL not only increases students' motivation but also enriches their learning experience and makes a real contribution to higher learning outcomes.

REFERENCES

- Anggraini, Fitria Dewi Puspita, Aprianti Aprianti, Vilda Ana Veria Setyawati, and Agnes Angelia Hartanto. 2022. "Pembelajaran Statistika Menggunakan Software SPSS Untuk Uji Validitas Dan Reliabilitas." *Jurnal Basicedu* 6(4):6491–6504. doi: 10.31004/basicedu.v6i4.3206.
- Bleicher, Robert E. 2014. "A Collaborative Action Research Approach to Professional Learning." *Professional Development in Education* 40(5):802–21. doi: 10.1080/19415257.2013.842183.
- Denham, André R., Robert Mayben, and Terri Boman. 2016. "Integrating Game-Based Learning Initiative: Increasing the Usage of Game-Based Learning Within K-12 Classrooms Through Professional Learning Groups." *TechTrends* 60(1):70–76. doi: 10.1007/s11528-015-0019-y.
- Heale, Roberta, and Alison Twycross. 2015. "Validity and Reliability in Quantitative Studies." *Evidence-Based Nursing* 18(3):66–67. doi: 10.1136/eb-2015-102129.
- Hsieh, Tzu Ling. 2014. "Motivation Matters? The Relationship among Different Types of Learning Motivation, Engagement Behaviors and Learning Outcomes of Undergraduate Students in Taiwan." *Higher Education* 68(3):417–33. doi: 10.1007/s10734-014-9720-6.
- Li, Ming Chaun, and Chin Chung Tsai. 2013. "Game-Based Learning in Science Education: A Review of Relevant Research." *Journal of*

- Science Education and Technology* 22(6):877–98. doi: 10.1007/s10956-013-9436-x.
- Meesuk, Parinya, Banleng Sramoon, and Angwara Wongrugs. 2020. “Classroom Action Research-Based Instruction: The Sustainable Teacher Professional Development Strategy.” *Journal of Teacher Education for Sustainability* 22(1):98–110. doi: 10.2478/jtes-2020-0008.
- Su, Chung Ho. 2016. “The Effects of Students’ Motivation, Cognitive Load and Learning Anxiety in Gamification Software Engineering Education: A Structural Equation Modeling Study.” *Multimedia Tools and Applications* 75(16):10013–36. doi: 10.1007/s11042-015-2799-7.
- Syah, M. Noor Sulaiman. 2016. “Classroom Action Research As Professional Development of Teachers in Indonesia.” *Jurnal Tarbawi* 13(1):1–16.
- Tsai, Chia Hui, Ching Hsue Cheng, Duen Yian Yeh, and Shih Yun Lin. 2017. “Can Learning Motivation Predict Learning Achievement? A Case Study of a Mobile Game-Based English Learning Approach.” *Education and Information Technologies* 22(5):2159–73. doi: 10.1007/s10639-016-9542-5.
- Wang, Meiqian, and Xudong Zheng. 2021. “Using Game-Based Learning to Support Learning Science: A Study with Middle School Students.” *Asia-Pacific Education Researcher* 30(2):167–76. doi: 10.1007/s40299-020-00523-z.