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The Implementation of GBL Towards Student's Grammar Understanding in AI at SMAN 3 Bengkulu City

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Abstrak

Penelitian ini menyelidiki dampak dari pembelajaran berbasis game terhadap pemahaman tata bahasa siswa di SMAN 3 Kota Bengkulu di era digital. Penelitian ini menggunakan desain kuasi-eksperimental, yang menggabungkan fase pre-test dan post-test. Untuk mencapai tujuan ini, dua kelas kelas 11 dipilih melalui purposive sampling: kelas eksperimen (n = 32) yang menggunakan platform berbasis game seperti Kahoot! dan kelas kontrol (n = 31) yang diajar dengan metode tradisional. Tes tata bahasa difokuskan pada bentuk simple present, simple past, dan simple future. Data dianalisis menggunakan statistik deskriptif, uji normalitas dan homogenitas, dan uji-t sampel independen melalui SPSS v30. Hasil analisis menunjukkan nilai signifikansi sebesar 0,000 (<0,05), yang menunjukkan adanya perbedaan yang signifikan secara statistik antara kedua kelompok. Temuan ini menunjukkan bahwa pembelajaran berbasis permainan secara signifikan meningkatkan pemahaman tata bahasa siswa dibandingkan dengan instruksi tradisional.

Kata kunci: *Pembelajaran Berbasis Permainan, Pemahaman Tata Bahasa, Kuasi Eksperimen, Konteks Pembelajaran Digital.*

Abstract

The study investigates the impact of game based learning on students' grammar understanding at SMAN 3 Bengkulu City in the digital era. The present study employed a quasi-experimental design, incorporating pre-test and post-test phases. To this end, two 11th grade classes were selected through purposive sampling: an experimental class (n = 32) that utilized game-based platforms such as Kahoot!, and a control class (n=31) taught with traditional methods. The grammar test focused on simple present, simple past, and simple future tenses. Data were analyzed using descriptive statistics, normality and homogeneity tests, and an independent sample t-test via SPSS v30. The analysis revealed a significance value of 0.000 (<0.05), indicating a statistically significant difference between the two groups. The findings suggest that game-based learning significantly improves students' grammar understanding compared to traditional instruction.

Keywords : *Game-Based Learning, Grammar Understanding, Quasi-Experimental, Digital Learning Context*

INTRODUCTION

Effective communication skills are becoming more and more crucial in the current digital era, particularly when it comes to language usage. Humans communicate with one another through communication. The development of language use in this advanced age seems to need that everyone be able to speak in multiple languages. It is quite easy for someone to relate to foreigners who speak various languages if they have good communication habits. There are laws and information regarding communication in different languages. Grammar is one of the most crucial aspects of learning language knowledge and norms. One of the most crucial elements of clear communication is grammar. Because it will be able to utilize proper grammar.

Learning grammar is often a challenging and boring process for students (Salsabila, 2023). Traditional grammar texts and exercises often fail to spark interest or provide opportunities to

practice in real contexts. This can lead to low levels of engagement, weak knowledge of the material, and ultimately inadequate communication skills. Along with the development of technology, learning methods are also changing. One approach that is gaining popularity is Game Based Learning (GBL). This method utilises game elements to increase student engagement, motivate them, as well as create a fun learning experience. GBL can help students understand grammar in a more interactive and practical way, so they can more easily internalise the material being taught.

Unfortunately, many students in Indonesia, including those at SMAN 3 Bengkulu City, still experience difficulties in understanding and mastering English grammar. Observations show thatthis is largely due to conventional and uninteresting learning approaches. Traditional teaching methods, such as lectures and repetitive practice questions, tend to be boring for students and do not facilitate active student engagement. In addition, most students tend to just memorise grammar rules without really understanding the context and real applications in communication. Students tend to be more motivated to learn when they feel involved in challenging yet fun games or simulations. This is in contrast to traditional learning approaches that present learning that tends to be monotonous and boring for some students, especially secondary school students. As a result, they often feel pressured and lack confidence in using English, especially in grammar (Meiliawati et al., 2024). The Game-Based Learning (GBL) method is not used in the existing educational process as a novel way to aid students in understanding grammar-related content. This is an important gap because studies have demonstrated that GBL improves students' comprehension and involvement in a variety of learning areas, particularly in language situations. Thus, the use of the GBL method to investigate its impact on the grammar understanding of grade XI students at SMA N 3 Bengkulu City would be the main subject of this study.

Thus, the purpose of this study is to investigate how GBL can be used to enhance students' comprehension of grammar. It is anticipated that this case study will uncover practical tactics that can be used to enhance students' learning outcomes and foster a more engaging learning environment. GBL is a teaching approach that makes use of game components to produce an engaging and entertaining learning environment. Grammar teaching issues may be resolved by the rise of game-based learning, which incorporates game components into non-gaming contexts.

By incorporating engaging tasks, points, challenges and rewards, gamified learning platforms such as Wordwall, Kahoot!, Educaplay and many more can transform grammar practice into an engaging and interactive experience (Niswah, 2022). This promotes involvement, inspires kids to overcome obstacles, and gives them quick feedback on their Game-based learning (GBL) has been increasingly adopted in the field of education, accompanied by various innovative developments. The introduction of serious games and gamification presents educators with alternative methods to enhance medical teaching(Xu et al., 2023).

Using gaming applications created especially to aid in the learning process is known as game-based learning. (Wibawa et al., 2020). Students must learn in this course, but they must do so in a playful way. Games are one type of media that might help improve brain skills in solving problems or resolving disagreements. The game based learning approach has a high learning value and improves abilities including effective decision-making, group communication, and critical thinking. Learning games are getting increasingly complex as AI advances because they can now modify the degree of difficulty, offer real-time feedback, and tailor the learning process to the needs of each individual student. More adaptive learning is made possible by AI technology, which enables the system to identify students' areas of strength and weakness and offer suitable practice.

By integrating game-based learning, students at SMAN 3 Bengkulu City may more effectively address their challenges with grammar. Previous studies have shown that game-based learning boosts motivation and achievement across various subjects including English. Its competitive, rewarding, and engaging elements can inspire learners to tackle even difficult topics like grammar. Therefore, this study aims to evaluate the impact of game-based learning on the grammar comprehension of SMAN 3 Bengkulu City students, particularly in the context of today’s digital era.

There are various benefits to researching the use of game based learning (GBL) in high school, namely in grade 11. Students in grade 11 are better prepared to use cutting-edge teaching strategies like GBL since they are often in a more emotionally and cognitively developed stage than those in earlier grades. Furthermore, grade 11 is a time when students frequently encounter increasingly difficult content, and as they get ready for the final exam, their motivation to learn tends to change. GBL can increase students' motivation and level of active engagement, which can enhance their comprehension of the subject matter. Grade 11 research offers a chance to evaluate if GBL is successful in assisting pupils in grasping more complex ideas prior to their senior year of high school.

The study's focus on three basic tenses- simple present, simple past, and simple future- because these are the foundations that must be mastered before students learn more complex language structures. Research shows that a strong understanding of these three basic tenses helps students master more difficult forms, such as the present perfect or past continuous, which have more specific usages and rules (Permana, 2020). In addition, high school students often struggle with basic concepts, so mastering basic tenses ensures they have a solid foundation that supports the development of advanced English language skills. The GBL method is very effective for improving the understanding of these basic concepts due to its interactive and motivating nature, so students are more motivated and actively engaged in learning basic grammar (Permana, 2020).

High school students' understanding of English learning, especially on grammar, is still low. The understanding of grammar among high school students in Indonesia is still quite low, especially in mastering simple tenses such as simple present tense, found that students only achieved an average score of 43.3 in the pre-test related to simple present tense, before the implementation of special methods such as drilling to improve their understanding. This difficulty is generally caused by a lack of vocabulary knowledge and complicated grammar rules, which makes many students feel overwhelmed by English lessons (Ayu Lestari & Nabah, 2019).

Effective communication skills are becoming increasingly important in the digital age, especially when using clear language. Understanding grammar is a clear and accurate communication tool that is still considered a challenge for students, including at SMAN 3 Bengkulu City. Conventional teaching methods often cause problems and are not very interesting for students, so they end up only understanding the context and using grammar rules in communicating.

Along with technological advances, the Game Based Learning approach has emerged as an innovative approach that uses game elements to provide an engaging and interactive learning experience. GBL can increase student engagement and help them understand language more fully. However, at SMAN 3 Bengkulu City, GBL has not yet been implemented, so a teaching method that can create more effective grammar teaching is needed.

METHOD

The present study employed a quasi-experimental approach, incorporating a pre-test and post-test control group model in order to evaluate the efficacy of Game Based Learning. (GBL) equipped with AI technology in improving students' grammar comprehension. The choice of quasi experimental design is based on its suitability for educational contexts, especially when random assignment of participants is not possible. This method allows comparisons to be made between experimental and control groups, while still maintaining the authenticity of the learning environment as it is conducted in a natural classroom setting.

The research took place at SMAN 3 Bengkulu City and focused on 11th grade students during the second semester of the 2024/2025 academic year. The experimental group received treatment through game-based grammar instruction using platforms like Kahoot! integrated with AI features such as real-time feedback and progress tracking. These game activities were specifically designed around key grammar topics including simple present, simple past, and simple future tenses. Meanwhile, the control group was taught using traditional, teacher-centered methods, such as direct instruction and written exercises, aligned with the standard school curriculum.

RESULTS AND DISCUSSION

Student Grammar Understanding of Experimental Class

Thirty two pupils are enrolled in the experimental topic class for game-based learning methodologies. A multiple-choice grammar test with fifty questions served as the tool. The Simple Past Tense, Simple Present Tense, and Simple Future Tense are the three tenses that are covered in this test. The students' pre-test and post-test results are displayed in the scores below:

Table 1 Grade results in the experimental *class*

No	Name	Pre-test	Post-test
1	Alan Farel	44	50
2	Alfarisi Alexandria	68	80
3	Anggi Athallah	52	70
4	Aqillah syifa	70	78
5	Aura	48	50
6	Bagas firmansyah	60	68
7	David Pratama	50	68
8	Dimas Adriansyah	48	60
9	fajar dwi S.	44	34
10	faridz Abdurrahman	40	56
11	Felycia evlyn	36	34
12	Fharis fhadillah	26	62
13	Geraldine	68	82
14	Ghefira Zahira	66	42
15	Habib	40	56
16	Keyizia	66	48
17	Khairunnisa	66	88
18	M. Adi Sutikna	38	48
19	M. Farhab Fadil	48	72
20	M. tifad	48	66
21	Mursyid	40	50
22	Nabilla nur	50	70
23	Patih negoro	74	82
24	Paza mayhero	66	74
25	Piter Jarnuarles	36	62
26	Puspita Amelia	40	64
27	Raihan	38	70
28	Rasti meilan sari	34	66
29	Shali	46	68
30	Shasya Nayla	66	72
31	Visnesha	68	74
32	Zain Muhammad Rafi	50	64

Based on table , the lowest Pre-Test score is 26 and the highest score is 74. In addition, the lowest Post-Test score is 34 and the highest is 88.

Table 2 Score Distribution in Experimental *Class*

Score Interval	Category	Pre-Test		Post-Test	
		Frequency	Percentage	frequency	Percentage
85-100	Excellent	-	-	1	3%
75-84	Good	-	-	4	13%
56-74	Fair	11	34%	19	59%
<55	Low	21	66%	8	25%

According to the above table, there are zero percent of students with pre-test scores in the excellent group, zero percent in the good category, eleven (34%) in the sufficient category, and twenty-one (66%) in the poor category. One student (3%) was in the excellent group, four students (13%) were in the good category, nineteen students (59%) were in the sufficient category, and eight students (25%) were in the poor category on the posttest.

Student Grammar Understanding of Control Class

In the Control is class that does not use game-based learning strategies to teach, there are 31 students in the control class , the following table shows the students' pre-test and post-test scores :

Table 3 Grade results in the control *class*

No	Name	Pre-test	Post-test
1	Adriyan	40	62
2	Ahmad Tri Musyahid	60	36
3	Airin Diva	46	38
4	Aisyah Nadiya	52	22
5	Aldo deni	38	16
6	Anita Loviana	36	44
7	Arif Rahman	52	58
8	Chylsa Putri	44	24
9	Ezy Al Pindri	50	56
10	Fharael	62	52
11	Fikriy Pratama	58	56
12	Fira Tyas	72	74
13	Iman Alfarezi	40	36
14	Intan Nuraini	50	66
15	keisya yumna	52	54
16	LolaMutia	52	60
17	Lovita Aprilia	44	60
18	M. Aziz	32	28
19	M. daffa	40	24
20	M. fadlan	52	40
21	M. Raka	34	54
22	Neppa	50	66
23	Nur Apni Oktavione	44	60
24	Olevia Sinta	42	60
25	Putri Rahayu	16	32
26	Ramdan 1	48	40
27	Rosa	22	30
28	Shely rahmat	66	74
29	Tety Dwi	42	54

30	Tiara Hargita	26	34
31	Vina Putri	22	38

Based on table , the lowest Pre-Test score is 16 and the highest score is 72. In addition, the lowest Post-Test score is 16 and the highest is 74.

Table 4 Score Distribution in Control *Class*

Score Interval	Category	Pre-Test		Post-Test	
		Frequency	percentage	frequency	Percentage
85-100	Excellent	-	-		
75-84	Good	-	-		-
56-74	Fair	5	17%	12	39%
<55	Low	26	83%	19	61%

According to the above table, there are zero percent of students in the excellent category, zero percent in the good category, eleven percent in the sufficient category, and twenty one percent in the poor category based on the pre-test result. There were one (%) student in the excellent category, three (%) in the good category, twenty four (%) in the sufficient category, and eight (%) in the low category on the posttest.

The Normality Data

Before evaluating the data, its normality must be determined. Normality is used to determine the normality of the data. This is determined using the Kolmogorov-Smirnov test.

Table 5 The normality test of pre-test in experimental *and control class*

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pre-test Control	.122	31	.200*	.978	31	.770
Post-test Control	.108	31	.200*	.929	31	.514
Pre-test Experimental	.189	32	.200*	.979	32	.787
Post-test Experimental	.125	32	.200*	.962	32	.653

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The experimental class's pre-test revealed a sig of 0.200, which was greater than 0.05. The experimental class's pre-test revealed that the sig of 0.787 was likewise more than 0.05 in the Shapiro-Wilk test. We can conclude that the collected data is regarded as typical.

The test on the pre-test in the control class showed that the sig was 0.200, higher than 0.05. While in the Shapiro-Wilk test, the pre-test in the control class showed that the sig of 0.770 was also higher than 0.05. It can be concluded that the data obtained is considered normal.

The experimental class's post-test revealed a sig of 0.200, which was greater than 0.05. The experimental class's post-tst revealed that the sig of 0.514 in the Shapiro-Wilk test was likewise greater than 0.05. We can conclude that the collected data is regarded as typical.

The control class's post-test revealed a sig of 0.200, which was greater than 0.05. The post-test in the control group revealed that the sig of 0.653 in the Shapiro-Wilk test was likewise greater than 0.05. We can conclude that the collected data is regarded as typical.

The Homogenitas of Variances Test

Table 6 *Test of Homogeneity of Variance*

Test of Homogeneity of Variance

	Levene Statistic	df1	df2	Sig.
Based on Mean	3.051	1	61	.086
Based on Median	2.284	1	61	.136
Based on Median and with adjusted df	2.284	1	60.810	.136
Based on trimmed mean	3.130	1	61	.082

The variance homogeneity test on the post-test indicates that a significant value of 0.082 is higher than the alpha threshold of 0.05 (0.082 > 0.05), as indicated by table 4.7 above. Thus, it can be said that the variance of the data is homogeneous.

Independent T-test

T-Test here is used to see if there is an influence that occurs on the skills of students who are the object of research. The results of the T-Test test data can be seen in the table below:

Table 7 Independent Sample *t Test*

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower	Upper
Hasil	Equal variances assumed	3.051	.086	-4.458	61	.000	-16.665	3.738	-24.141	-9.190
	Equal variances not assumed			-4.446	58.658	.000	-16.665	3.749	-24.167	-9.164

Formulation for interpretng significant values:

The independent variable affects the dependent variable if the level of significance is less than α (0.05). The independent variable has no effect on the dependent variable if the level of significance is greater than α (0.05). As can be seen from the preceding table, which assumes equal variances, the data variance is homogenous (0.086 > 0.05) with a Levene's F value of 3.051 and a significance value (Sig.) of 0.086. The degree of freedom (df) is 61, the significance value (2-tailed) is 0.000, and the t value is -4.458.

The significance value (2-tailed) is 0.000, which is less than 0.05 (0.000 < 0.05) according to the hypothesis rule. This indicates that H_1 is approved and H_0 is refused. Consequently, it can be said that students who received instruction through game-based learning and those who received instruction through the traditional technique differ significantly in their comprehension of grammar. This finding demonstrates that game-based learning significantly improves Grade 11 students' grasp of grammar at SMAN 3 Bengkulu City.

CONCLUSION

The mean grammar scores of the experimental and control groups were significantly different, which confirms that game-based learning is a useful strategy for improving grammar comprehension this can be seen from the independent samples t-test results. Moreover, based on the responses collected from student feedback forms, more than 50% of the students in the experimental group agreed that game-based learning not only increased their motivation to study grammar but also helped them to think more critically. They appreciated the opportunity to collaborate, engage in meaningful practice, and apply grammar rules in interactive contexts. Many reported that the game-based activities made the learning process more enjoyable and helped them retain information more effectively.

This finding is supported by previous research such as that conducted by Amalia (2021), which concluded that the use of educational games significantly improves students' grammatical competence. Similarly, this study at SMAN 3 Bengkulu City demonstrates that game-based learning has a positive and significant effect on students' grammar understanding, particularly in tenses, and fosters a more engaging and student-centered learning environment. Additionally, the relevance of game-based learning in the digital age cannot be overstated. Today's students often referred to as "digital natives" are more comfortable with technology and expect engaging and interactive learning environments. By incorporating game elements into grammar lessons, teachers can bridge the gap between students' everyday digital experiences and classroom instruction, thereby increasing both effectiveness and engagement. At the end of this discussion, it can be seen that learning with this new method is more interesting and innovative to teach grammar, especially in the context of 21st century learning that emphasizes digital literacy, collaboration, and student engagement.

In conclusion, it shows that learning with this method is not only a fun alternative to traditional grammar teaching, but also a pedagogically sound and effective method for improving students' grammar comprehension.It empowers students, fosters collaboration, supports differentiated learning, and aligns with the characteristics and needs of learners in the 21st-century classroom.

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