LUNAR (Language and Art)
ISSN: 2541-6804
Vol. 9 No. 2 November 2025

Enhancing Student Learning Outcomes Using Game-Based Learning

Febry Saputra[1], Dian Arief Pradana[2], St. Shabibatul Rohmah[3]
[1,2,3]Universitas 17 Agustus 1945 Banyuwangi
febrysaputra236@gmail.com

ABSTRACT

The study investigated the impact of game-based learning using Wordwall media in enhancing learning outcomes and student engagement among eighth-grade students in an English grammar lesson. This research was initiated to address low grammar mastery and engagement at the research location, where preliminary data showed an average pretest score of 67.4 with most students failing to meet the minimum passing criteria. This study used a quantitative pre-experimental design with a pretest-posttest one-group design, involving 20 students. Data were collected through pretest-posttest assessments and observations measuring behavioral, emotional, and cognitive engagement. Paired t-test results showed significant improvement in learning outcomes, with a mean score increase of 14.20 (SD = 5.58). The calculated t-value was 11.384, exceeding the critical t-table value of 2.093 at df = 19, and the two-sided significance value was 0.000, confirming statistical significance. Observations revealed increased engagement across all three dimensions. These findings demonstrate the efficacy of game-based learning in enhancing academic performance and student engagement, offering an effective solution to the learning challenges identified. Further research is recommended to explore long-term effects and applicability across different subjects and age groups.

Keywords: *Game-Based Learning; Learning Outcomes; Student Engagement*

A. Introduction

Nowadays, education faces many new challenges in maintaining student engagement in the classroom. Student engagement is increasingly becoming a crucial issue, especially during the junior high school years. Student engagement is often associated with learning outcomes, as it can affect student learning outcomes. Preliminary observations and pretest results showed that students had difficulty mastering grammar, as indicated by an average pretest score of 67.4, with 65% of students failing to reach the passing threshold. This was mainly due to passive learning and low engagement caused by traditional, teacher-led methods. To tackle this local issue, the study aimed to introduce Game-Based Learning using Wordwall media to improve both learning outcomes and student engagement. Study shows teachers face challenges due to decreased student engagement and motivation in learning (Alsawaier,

2018). At this arrange, student regularly engagement a decrease in learning engagement within the classroom, which can have a negative affect on their academic performance. Concurring to Hitchens & Tulloch, (2018) Empowering students to do vital assignments like partaking in lesson discourses, and other assignments or doing learning gets to be progressively troublesome.

Engagement is fundamental for academic achievement. More absolutely, it has been decided that one of the foremost significant components in evaluating the calibre of education and recognizing the probability of students' future scholarly accomplishment is their level of cooperation within the learning environment (Chen et al., 2021). The perfect adjust of instruction and entertainment is made by educates based on the prerequisites of their students and the circumstances (Alsawaier, 2018). Based on the model by Fredricks et al. (2004), student engagement is a multidimensional concept consisting of behavioral, emotional, and cognitive engagement. Behavioral engagement reflects students' active participation in academic and social activities, while emotional engagement is related to their positive attitudes and feelings toward the learning process, teachers, and peers. Cognitive engagement is demonstrated through the mental effort and perseverance exerted to master challenging material. This three-dimensional concept is emphasized by Fredricks et al. (2019) and Bond et al. (2020) as a form of dynamic collaboration, initiative, and mental effort on the part of students. A study by Hong et al. (2020) highlights that of the three dimensions, behavioral engagement can be considered the most important indicator.

In the meantime, students' utilization of gaming has expanded altogether and is presently a major angle of their life. In addition to being engaging, both conventional and computerized recreations may improve participation, problem-solving, and cognitive capacities. Compared to conventional teacher-centred educating strategies, game-based learning (GBL) and gamification approaches have appeared to be more compelling in moving forward student engagement and learning results (Khan et al., 2017). Game-based learning has a favourable impact on students' motivation and academic achievement, making it one of the fastest growing strategies in the modern educational landscape (Sun et al., 2023).

Game-based learning (GBL) has been an increasingly popular strategy over the past few years. Games may be used in sustainability education to satisfy the needs of today's students who prefer hands-on, group projects, and the students like the interactive, cooperative, and fully engaged learning environment that these games offer (Emblen-Perry, 2018). Through virtual settings, game-based learning may be developed to enhance preparation abilities, hence promoting social engagement and development of competencies (Sousa & Rocha, 2019). By joining game-based learning procedures into the classroom, it is conceivable to closed the gap between students' side interface and formal instruction. For student inside the show age, this strategy can make a more enthusiastic, inquisitively, and related learning environment.

Utilizing platforms like Wordwall can enhance the game-based learning experience by providing interactive activities that engage students more deeply. Wordwall is a web-based learning medium that allows teachers to create various interactive games and educational quizzes (Oviliani & Susanto, 2023). This platform functions as a fun educational and assessment tool, increasing student engagement, and can be tailored to classroom needs. This learning model can be applied to various materials to aid student understanding (Putra et al., 2024). The platform's instant feedback feature and support for collaborative learning further support the learning process, making Wordwall an effective tool for integrating game elements into education. Wordwall allows educators to create quizzes, matching games, and other interactive formats that can be tailored to specific learning objectives, aligning with the GBL approach. This integration provides immediate feedback to students, fostering a more dynamic learning atmosphere. Few considers, in any case have looked closely at the impacts of game-based learning. Research on how game-based learning (GBL) affects student engagement is few. Although further research is required to evaluate the intricacies and long-term impacts of GBL in education, this study provides first evidence in favor of the hypothesis that GBL may improve deep learning in these contexts by raising pleasure (Crocco et al., 2016).

The utilization of instructive diversions within the classroom is developing in ubiquity, and game-based learning (GBL) has been included into a variety of instructing methodologies, and playing instructive diversions can have a critical effect on how well

students learn, such as engagement, inspiration, and fulfilment (Yu et al., 2021). A well-made guidelines amusement may allow students a stage to hone these abilities in a locked-in and pertinent setting, which can boost their engagement. In their study, Plass et al. (2020) Well-designed instructive recreations may give an immersive and locked-in learning encounter by expanding students' natural inspiration with components such as deterrent, control, and intrigue. The utilization of game-based learning (GBL) in junior high school is still generally modern and has not gotten much consideration. Investigate is required to decide the impacts of this methodology on student engagement as well as how well it can be connected to junior high school instruction. Game-based learning (GBL) can move forward scholarly execution and cultivate inherent inspiration in students at all levels of consideration. The field of gamification and game-based learning is developing and advancing quickly (Henry et al., 2024).

To guide the study, the following research questions are addressed:

1. Is there an improvement in student learning outcomes on grammar material after using game-based learning?
2. Is there an increase in student engagement after using wordwall media?

Researchers have investigated the use of game-based learning on the impact on students. In junior high school level, game-based learning (GBL) had an effective effect on student engagement through the deployment of computer technology, as opposed to the traditional lecture-focused teaching technique and through statistical analysis, the Friedman, Mann-Whitney U, and Wilcoxon Signed Rank tests were used to arrive at findings (Khan et al., 2017). The use of gamification on students shows that gamification increases student engagement with e-learning systems by integrating a gamified question board platform into an existing university e-learning portal and analysing its use over a 10-month period (Bouchrika et al., 2021). in the digital age the use of technology in games is very relevant for students, based on Balalle (2024) using platforms such as Kahoot! through entertaining and engaging activities, technologies like learning management systems, apps based on virtual reality, and applications based on artificial intelligence have been shown to be helpful in raising student engagement and comprehension. In their study, Sun et al. (2023) identified the importance of implementing game-based features in order to enhance positive aspects such as student

engagement, motivation, and academic achievement in intelligent game-based learning environments but also, have the potential for distraction, which can have a negative effect, especially for students with poor self-regulation skills.

Students' engagement in the emotional, cognitive, and behavioral domains can be used to assess their accomplishment of learning outcomes. Gamification has the power to alter student engagement levels in addition to their behavior and attitudes (Rivera & Garden, 2021). The effect of use may vary from individual to individual depending on student characteristics. In their inquiry about, Smiderle et al. (2020) an experiment was conducted over four months with 40 first-year students majoring in programming. The students were arbitrarily separated into two groups: one group utilized a gamified adaptation (with rankings, focuses, and identifications), and the other group utilized a non-gamified adaptation. The study showed that game-based play in instruction can increment the level of student engagement by impacting clients in an unexpected way based on their identity characteristics.

This research aims to investigate how game-based learning can enhance the learning experience of grade 8 students, focusing on increasing student engagement in the classroom. Many digital gaming platforms can be used. but this research will utilise the Wordwall platform can basically enhance this encounter by giving intuitive and customisable exercises that adjust to GBL standards for some occasions, instructors can create keys in tests and recreations that enable students to collaborate and compete, foster a sense of community and enhance their cognitive abilities. Wordwall's quick input component can encourage students to persuade other students, making the learning handle more energetic and feasible, then maximising the engagement of other students and making better learning outcomes, making an immersive instructive encounter that meets the desires of today's students.

B. Research Method

The study used quantitative research using pre-experimental design and one experimental group pretest-posttest design. An approach used to evaluate the effects of an intervention or treatment without having a control group (Creswell, 2014). The selection of this approach is based on the fact that this study wants to see the influence of game-based learning employing Wordwall media on learning outcomes without

comparing with a control group. In this design, only one group is given treatment, and the results are measured through comparison between pretest and posttest.

The selected group will be given a pretest to determine the initial condition before treatment. After that, the group will receive treatment in the form of learning with Game-Based Learning using Wordwall media. The implementation of Game-Based Learning utilizing Wordwall media in English learning for four gatherings is planned to make it less demanding for students to get linguistic use materials through engaging interactive exercises, beginning with the primary assembly that centers on straightforward display tense through Wordwall tests, gathering dialogs, and diversions such as Open the Box and Match-Up to distinguish the right utilization of verbs and classify sentences as propensities or actualities. Within the moment assembly, students learn straightforward past tense by orchestrating arbitrary words into correct past tense sentences within the Unjumble amusement and gathering normal and sporadic verbs through Group Sort, whereas the third assembly covers Wh-Questions by completing sentences utilizing the proper address words and replying to questions based on arbitrary clues in Open the Box. The final assembly instructs comparative degree through a bunch sort diversion to coordinate descriptive words with their comparative shapes, a test on choosing the proper comparative shape, and a movement on positioning things from shortest to most noteworthy, where the total set of exercises not only moves forward language structure comprehension but also keeps up student inspiration and engagement through Wordwall's intelligent highlights that give moment criticism, permitting instructors to powerfully alter materials based on student reactions. During the implementation of game-based learning in the classroom, observations of student engagement were also conducted. After the treatment period is over, the group will be given a posttest to measure the improvement of English grammar learning outcomes and student engagement level.

The study took place in an XYZ junior high school. The characteristics of the participants include students with an age range of 13-14 years who are currently studying at the 8th grade level and follow English learning as a compulsory subject. Sampling was conducted using purposive sampling technique by considering the equality of student engagement ability based on the average score of English in the

previous semester. According to Creswell (2014) The sample was selected following particular requirements related to the study aims. One class was selected as the research sample, class 8 with about 20 students.

The research tools employed in this study included both test and non-test instruments, including pretest-posttest and observation. The test instruments consisted of pretest and posttest questions designed to assess students' learning results in English grammar. The questions comprised 25 multiple-choice options.

Non-test instruments employed student activity observation sheets to assess student engagement during the educational process while employing game-based learning using wordwall media.

Pretest is a test given to students before they receive treatment in the form of learning with Game-Based Learning method using wordwall media. The pretest tries to assess students' initial abilities in English learning materials on grammar. By knowing the initial ability of students, researchers can compare it with the results of the posttest after the treatment is given, so as to evaluate the efficiency of the learning approach implemented. Then the posttest is a test conducted after the treatment. The aim of the posttest is to measure the improvement of students' learning outcomes after they receive treatment using the game-based learning method using wordwall media. By comparing the results of the pretest with the posttest, it can evaluate the extent to which the Game-Based Learning method sees student engagement so that it has an effect on improving student learning outcomes.

Observations were made using an observation sheet when the treatment was given to students. The purpose was to see students' engagement in learning English using game-based learning. The observation sheet was separated into three categories: behavioral engagement, emotional engagement, and cognitive engagement.

Systematic and objective calculations that use numerical data to test hypotheses and research questions (Creswell, 2014). Pretest-posttest analysis using t-test on one sample or known as paired sample t-test is a statistical analysis technique to compare the measurement results before (pretest) and after (posttest) treatment in the same group. This technique is used to determine whether or not there is an effect of a

LUNAR (Language and Art)
ISSN: 2541-6804
Vol. 9 No. 2 November 2025

treatment using game-based learning using wordwall media given. The calculation of pretest and posttest results was carried out using SPSS statistical software version 25.

There are two ways that can be used. First, comparing the calculated t value with the t table at a certain significance level (0.05) and degree of freedom (df = n-1). If the value of t score > t table, then H0 is refused, while Ha is accepted, indicating a substantial difference between the pretest and posttest results. The second approach is to examine the significance value (p-value). If the significance value is < 0.05, Ho is rejected, whereas Ha is accepted. This indicates a substantial difference among the pretest and posttest scores, indicating the treatment's effectiveness.

The observation sheet will be described descriptively. Engagement indicator is present, such as actively asking questions, showing happy facial expressions, and independent learning.

C. Research Finding and Discussion

Based on the pre-test and post-test results, the following values were obtained:

Table 1. Result of Pre-test and Post-test

STUDENTS	PRE-TEST	POST-TEST
ASP	72	80
ASR	64	80
BP	60	80
CDA	64	84
DMW	76	80
FK	72	84
FKh	72	92
IF	68	76
JR	68	88
KA	56	72
LD	76	88
NA	76	80
Nar	68	84
NMA	60	80
NNS	80	92
RJ	52	72
RN	68	76
SM	68	88
ST	64	80
TR	64	76

LUNAR (Language and Art)
ISSN: 2541-6804
Vol. 9 No. 2 November 2025

In table 1. the average (mean) pre-test score is 67.4. Based on the results of the mean post-test score, it needs to be improved because the average score is still relatively insufficient and has not entered the minimum criteria of mastery learning or criteria for achieving learning objectives, with the post-test in order to show the extent of students' understanding and ability to understand grammar material using the game-based learning method with Wordwall media so that after going through the learning process, students can understand and reflect on the effectiveness of the method or material provided. Based on table 1. the average post-test is 81.6, which shows a significant increase of 14.2 points after using game-based learning method using Wordwall. This proves that the learning intervention successfully increased the value of students' learning outcomes.

Tests of Normality

Before conducting a paired test, a normality test was carried out. The function of this test is to determine whether the differences between paired observations are normally distributed. These are the key assumptions for a paired t-test (pretest and posttest). The normality test uses the SPSS 25 version with the Shaphiro-Wilk formula because the amount of data is 20. With an alpha level decision of 5% or 0.05, with the following conditions:

Sig value. > 0.05 then the normality assumption is fulfilled
Sig value. < 0.05 then the assumption of normality is not met

Table 2. Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Category	Statistic	df	Sig.	Statistic	df	Sig.
RESULT	PRETEST	.133	20	.200*	.968	20	.717
	POSTTEST	.208	20	.024	.936	20	.201

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

According to table 2, the results of the normality test in the Shapiro-Wilk test section show that the Sig. value on the pretest is 0.717 and the posttest value is 0.201.

LUNAR (Language and Art)
ISSN: 2541-6804
Vol. 9 No. 2 November 2025

The Sig. value on the pretest and posttest is larger than 0.05, implying that the test data is normally distributed, allowing the t test to be performed.

Table 3. Paired Samples T Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	POSTTEST - PRETEST	14.20000	5.57815	1.24731	11.58934	16.81066	11.384	19	.000

The paired t-test results in table 3. show the mean increase in post-test scores over pre-test was (14.20000) points with a standard deviation of (5.57815), showing variation between students but an overall positive trend and the standard error of the mean was recorded at (1.24731). The 95% confidence interval is (11.58934-16.81066). The t-test reinforced these findings with a t-value of 11.384 while the t-table value with degrees of freedom (df) = 19 is 2.093 so based on these results the calculated t is greater than the t table (11.384 > 2.093). This very large t value indicates that the difference between the pre-test and post-test is very significant. The larger the t value, the stronger the evidence that there is a real difference and the two tailed significance value (0.000) indicates that the result is less than 0.05, showing that, this difference is highly statistically significant. Thus, the null hypothesis (H0) is rejected whereas the alternative hypothesis (Ha) is accepted.

The results of the paired t-test statistical analysis using SPSS version 25 illustrate that the application of the game-based learning method with Wordwall media in teaching English grammar has significantly improved students' learning outcomes. The significant increase in the mean post-test score, as well as the standard deviation that supports the consistency of the results, indicates that this method is effective for English language learning. The t-test results, which showed significance, support the conclusion that game-based learning is a method worth considering in classroom teaching strategies. Thus, game-based learning using Wordwall may be regarded one of

LUNAR (Language and Art)
ISSN: 2541-6804
Vol. 9 No. 2 November 2025

the most advantageous learning approaches at the junior high school level. The findings suggest that the game-based learning approach through Wordwall effectively makes the learning environment more locked and interactive, thus advancing and improving students' learning outcomes.

Based on classroom observations using observation sheets conducted over four meetings, Wordwall Media's use of play-based learning clearly magnified student commitment in three key aspects: behavioral, emotional and cognitive engagement. This improvement was gradually seen from meeting 1 to meeting 4 gradually in meetings with each of the three key student indicators. This suggests that the game-based approach can create an interactive learning environment and motivate students to be actively engaged.

Table 4. Result Observation Sheet

No.	Students	Emerging Indicators of Student Engagement			
		Meeting 1	Meeting 2	Meeting 3	Meeting 4
1	ASP	1	2	3	3
2	ASR	1	2	3	3
3	BP	2	2	3	3
4	CDA	2	3	3	3
5	DMW	2	2	3	3
6	FK	1	2	3	3
7	FKh	2	2	3	3
8	IF	1	2	3	3
9	JR	2	3	3	3
10	KA	1	2	2	3
11	LD	1	2	3	3
12	NA	2	3	3	3
13	NAr	1	2	3	3
14	NMA	1	2	3	3
15	NNS	1	2	3	3
16	RJ	1	2	3	3
17	RN	1	2	3	3
18	SM	1	2	3	3
19	ST	1	2	3	3
20	TR	1	2	3	3

LUNAR (Language and Art)
ISSN: 2541-6804
Vol. 9 No. 2 November 2025

Based on the data from the observation sheet conducted amid the four gatherings, there's an increment in student engagement, which incorporates behavioral, emotional, and cognitive viewpoints after the implementation of game-based learning utilizing Wordwall media. The engagement indicators are evaluated on a scale of 1 to 3, where a score of 1 shows the appearance of one engagement indicator, a score of 2 demonstrates two indicators, and a score of 3 reflects the greatest engagement with all three indicators. To begin with meeting, most students (12 out of 20) were still at level 1, whereas 8 students came to level 2, showing the adjustment phase to the unused learning strategy. Be that as it may, within the moment meeting, there was a noteworthy advancement with 16 students coming to level 2 and 4 students (CDA, JR, KA, and NA) indeed coming to level 3, demonstrating an increment in dynamic participation (behavioral) and intrigue (emotional). By the third meeting, the larger part of students (19 out of 20) had come to level 3, with KA remaining at level 2, as it were. This enhancement reflected the dominance of cognitive engagement, driven by game challenges that invigorated basic thinking. By the fourth meeting, all students (100%) had come to level 3, appearing consistent in all three indicators of engagement. A few students, such as CDA, JR, and NA, appeared to have speedy adjustment by coming to level 3 since the moment of meeting, whereas other students, such as ASR, ASP, and FK, took longer, coming to level 3 within the third meeting. This demonstrates that game-based learning is able to extend engagement continuously, with a few students requiring more time to completely engage.

a. Behavioral Engagement

Behavioral engagement alludes to students' dynamic participation within the learning handle, counting prompt participation, interaction with instructors and friends, and assignment completion. In the first meeting, most students were still adjusting to the game-based learning method. A few students still had a detached demeanor, such as fairly taking in information without the activity to ask questions. However, from the second to the fourth meeting, there was a significant increase in the behavioral engagement indicator. In Meeting 2, there was a critical enhancement where students started to be more excited, such as BP, who came early since he was

energized to play Wordwall, and ASP, who effectively compared scores with friends to see their advance. Entering Meetings 3 and 4, students' behavior has to be more active and independent. For example, student FK, who was initially hesitant to participate and ask questions related to the game, showed remarkable progress - by the fourth meeting, he not only came early to the lesson but also actively raised his hand to ask questions about the learning or game features of Wordwall. The students arrived on time, and no one was absent for all four meetings, demonstrating their commitment to learning. In addition, students became more active in participating in game activities, such as raising their hands to ask questions (e.g., student FK asked three clarifying questions about the game rules in the third session), discussing, and completing the Wordwall game challenges and quiz within the allotted time. In the third and fourth meetings, almost all students were directly involved in the game without the need for much instruction from the researcher, even some students enthusiastically asked for additional explanations when there were game mechanics that they did not understand. This shows that game-based learning using Wordwall media is able to increase students' behavioral engagement consistently.

b. Emotional Engagement

In the aspect of emotional engagement, there was also a noticeable increase. Emotional engagement is reflected within the expression of positive feelings such as happiness, pride, and excitement amid learning. At the beginning of the meeting, some students still looked hesitant and lackluster, such as ASP students who were always silent when the researcher explained the lesson and only saw their friends playing first. However, after trying the games on the Wordwall, their facial expressions changed to become more cheerful, such as smiling and laughing when successfully completing the group sort and quizz game challenges on the wordwall. The change in ASP was particularly striking - from a student who was quietly disinterested in the first meeting, in the third meeting he was seen cheering happily when he made it to the top score on the wordwall leaderboard in the matching pairs game. When confirmed directly to students, most students admitted that they felt happy and motivated to learn through games because this method is more interactive than conventional learning. In addition, social relations between students also

improved, as seen from the way they supported each other and helped friends who were having difficulty in completing the challenges, including ASP who began to actively help their friends understand the rules of the game. In the fourth meeting, the classroom atmosphere became livelier as students not only focused on the game, but also built positive interactions with classmates.

c. Cognitive Engagement

At the beginning of the meeting, only a few students took notes or tried to understand the material in depth. However, as time went by, students began to develop independent learning strategies, such as noting important points of grammar while playing and looking at the game assessment feedback that had been done to see the correct and incorrect answers to be used as self-evaluation. For example, JR students who understand the material before it is explained by the researcher and often have high scores when playing quizzes at each meeting. students also find their own way of learning by using a translator to understand new vocabulary that they do not understand when playing Wordwall such as when playing unjumble games. Students also discussed with friends to solve problems in the game. In the third and fourth meetings, some students were even able to explain the material to their friends with their own understanding (e.g., JR with his understanding of simple past tense material he explained to his friends when playing the complete the sentence game). In addition, students' average scores in completing game challenges and quizzes increased, indicating that they were not only surface-engaged, but also understood the learning content well.

The findings of the research show how effectively game-based learning (GBL) with Wordwall media may enhance eighth-grade students' learning outcomes and academic involvement in English grammar lessons. Based on the paired t-test findings, the quantitative analysis revealed a statistically significant shift in learning outcomes ($t = 11.384 > 2.093$, $sig. = 0.000 < 0.05$). From the pretest to the posttest, the median score increased by 14.20 points, demonstrating that the mediation significantly improved the students' comprehension of the language's structural fabric. This aligns with past inquiries by Yu et al. (2021), which highlighted the potential of advanced recreations and gamification to improve academic performance.

Moreover, this study watched critical upgrades in student engagement over behavioral, passionate, and cognitive measurements. Behaviorally, students got to be more active participants, arriving on time, asking questions, and completing challenges eagerly. This aligns with the engagement demonstration of Fredricks et al. (2004), which highlights active involvement as a crucial sign of behavioral engagement. Students increased emotional motivation and optimistic attitudes about studying created a lively and encouraging learning environment. These findings are consistent with research by Plass et al. (2020), who discovered that elements like challenge and control in well-designed educational recreations can foster innate imagination. Cognitively, students displayed deeper learning strategies, such as group discussions and self-evaluation, which are essential for comprehension and long-term preservation (Bond et al., 2020).

The implementation of Wordwall Media in game-based learning fostered a collaborative learning environment and advanced academic achievement, aligning with Sousa & Rocha (2019) on how GBL promotes essential social interaction and collective problem-solving, as interactive features like word walls facilitated knowledge exchange and reinforced socio-cognitive skills, especially valuable in language learning. This research also exposes the adaptability of GBL to varied learning styles, where students struggling with traditional methods engaged with Wordwall's visually stimulating activities, supporting Chen et al. (2021) that technically enhanced learning accommodates diverse preferences through formats like quizzes and word jumbles, which cater to individual strengths and classroom heterogeneity. The progressive enhancement in engagement over four gatherings indicates students required adjustment time, with the highest level reached by the fourth assembly, demonstrating Wordwall's effectiveness in supporting interest, as argued by Khan et al. (2017) on GBL's transformative potential; however, the variability in adjustment pace highlights the importance of considering individual differences, as noted by Smiderle et al. (2020).

The limitations of this research incorporate the small test measure (20 students) and the focus on a single subject in English grammar at the 8th grade level. Future inquiries might investigate the long-term impacts of GBL on different subjects, bigger populations, and distinctive age groups. Moreover, exploring the part of person

characteristics, such as self-regulation skills, may give more profound experiences into how GBL impacts diverse learners (Sun et al., 2023).

D. Conclusion

Based on the findings of this study, the implementation of game-based learning using Wordwall media can enhance learning outcomes and student engagement in English grammar lessons in grade 8 at a XYZ junior high school. Quantitative analysis using SPSS version 25 showed a factually significant increase in English grammar scores, as evidenced by a paired t-test ($t = 11.384 > 2.093$), with an average increase of 14.20 points between the pretest and posttest. This demonstrates the effectiveness of game-based learning in promoting academic achievement or learning outcomes. These findings unequivocally support the game-based learning method using Wordwall media is effective in promoting better understanding and driving academic achievement by significantly enhancing students' learning outcomes.

In addition, classroom observations showed significant improvements on all measures of substitute student engagement. Behaviorally, the students became more active members asking questions about the game and materials, arriving on time and eagerly completing the challenges of the Wordwall game. Emotionally, they showed greater motivation and satisfaction, creating a positive classroom atmosphere. Cognitively, students created deeper learning procedures through self-evaluation and peer discourse. This suggests that this game-based learning method such as Wordwall can successfully transform the conventional learning situation into a locked and student-centered encounter. However, further research is recommended to examine the long-term effects of GBL and its applicability across different subjects, larger number of participants and age groups.

E. Reference

Alsawaier, R. S. (2018). The effect of gamification on motivation and engagement. *The International Journal of Information and Learning Technology*, *35*(1), 56–79.

Balalle, H. (2024). Exploring student engagement in technology-based education in relation to gamification, online/distance learning, and other factors: A systematic literature review. *Social Sciences and Humanities Open*, *9*(October 2023), 100870. https://doi.org/10.1016/j.ssaho.2024.100870

Barkley, E. F., & Major, C. H. (2020). *Student engagement techniques: A handbook for college faculty*. John Wiley & Sons.

Bond, M., Buntins, K., Bedenlier, S., Zawacki-Richter, O., & Kerres, M. (2020). Mapping research in student engagement and educational technology in higher education: A systematic evidence map. *International Journal of Educational Technology in Higher Education*, *17*, 1–30.

Bouchrika, I., Harrati, N., Wanick, V., & Wills, G. (2021). Exploring the impact of gamification on student engagement and involvement with e-learning systems. *Interactive Learning Environments*, *29*(8), 1244–1257. https://doi.org/10.1080/10494820.2019.1623267

Chen, Y.-C., Lu, Y.-L., & Lien, C.-J. (2021). Learning environments with different levels of technological engagement: a comparison of game-based, video-based, and traditional instruction on students' learning. *Interactive Learning Environments*, *29*(8), 1363–1379.

Crocco, F., Offenholley, K., & Hernandez, C. (2016). A Proof-of-Concept Study of Game-Based Learning in Higher Education. *Simulation and Gaming*, *47*(4), 403–422. https://doi.org/10.1177/1046878116632484

Emblen-Perry, K. (2018). Enhancing student engagement in business sustainability through games. *International Journal of Sustainability in Higher Education*, *19*(5), 858–876. https://doi.org/10.1108/IJSHE-05-2017-0075

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). *School Engagement: Potential of the Concept, State of the Evidence* (Vol. 74, Issue 1).

Fredricks, J. A., Reschly, A. L., & Christenson, S. L. (2019). Interventions for student engagement: Overview and state of the field. In *Handbook of Student Engagement Interventions: Working with Disengaged Students*. Elsevier Inc. https://doi.org/10.1016/B978-0-12-813413-9.00001-2

Henry, J., Li, F., & Arnab, S. (2024). On the Pre-Perception of Gamification and Game-Based Learning in Higher Education Students: A Systematic Mapping Study. *Simulation & Gaming*, 10468781241271082.

Hitchens, M., & Tulloch, R. (2018). A gamification design for the classroom. *Interactive Technology and Smart Education*, *15*(1), 28–45.

Hong, W., Zhen, R., Liu, R. De, Wang, M. Te, Ding, Y., & Wang, J. (2020). The longitudinal linkages among Chinese children's behavioural, cognitive, and emotional engagement within a mathematics context. *Educational Psychology*, *40*(6), 666–680. https://doi.org/10.1080/01443410.2020.1719981

Khan, A., Ahmad, F. H., & Malik, M. M. (2017). Use of digital game based learning and gamification in secondary school science: The effect on student engagement, learning and gender difference. *Education and Information Technologies*, *22*(6), 2767–2804. https://doi.org/10.1007/s10639-017-9622-1

Oviliani, T. M., & Susanto, R. (2023). The effect of wordwall educational game-based learning media on interest in learning natural sciences. *Education and Social Sciences Review*, *4*(1), 27–33.

Plass, J. L., Mayer, R. E., & Homer, B. D. (2020). *Handbook of game-based learning*. Mit Press.

Putra, L. D., Arlinsyah, N. D., Ridho, F. R., Syafiqa, A. N., & Annisa, K. (2024). Pemanfaatan Wordwall pada Model Game Based Learning terhadap

Digitalisasi Pendidikan Sekolah Dasar. *Jurnal Dimensi Pendidikan Dan Pembelajaran*, *12*(1), 81–95.

Rivera, E. S., & Garden, C. L. P. (2021). Gamification for student engagement: a framework. *Journal of Further and Higher Education*, *45*(7), 999–1012. https://doi.org/10.1080/0309877X.2021.1875201

Smiderle, R., Rigo, S. J., Marques, L. B., Peçanha de Miranda Coelho, J. A., & Jaques, P. A. (2020). The impact of gamification on students' learning, engagement and behavior based on their personality traits. *Smart Learning Environments*, *7*(1). https://doi.org/10.1186/s40561-019-0098-x

Sousa, M. J., & Rocha, Á. (2019). Leadership styles and skills developed through game-based learning. *Journal of Business Research*, *94*, 360–366. https://doi.org/10.1016/j.jbusres.2018.01.057

Sun, L., Kangas, M., & Ruokamo, H. (2023). Game-based features in intelligent game-based learning environments: A systematic literature review. *Interactive Learning Environments*, 1–17.

Yu, Z., Gao, M., & Wang, L. (2021). The effect of educational games on learning outcomes, student motivation, engagement and satisfaction. *Journal of Educational Computing Research*, *59*(3), 522–546.