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Gamifying Vocabulary Learning: The Effectiveness of Digital Game-Based Learning in Motivating EFL Learners

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Abstract

This study examines the effectiveness of game-based learning in boosting motivation among EFL junior high school students in Yogyakarta, Indonesia, utilizing a Self-Determination Theory (SDT) framework. The research used a quasi-experimental method to assess the influence of digital game-based learning on student motivation. The research was conducted pre- and post-test in a single subject class. Data were gathered from 31 students through adapted Self-Regulation Questionnaires for Learning (SRQ-L), supplemented by semi-structured interviews to gain deeper insights into students' motivational experiences. This research revealed a notable enhancement in autonomous motivation relative to managed motivation, with students predominantly motivated by intrinsic reasons such as curiosity and the perceived value of English proficiency. Results from the Wilcoxon Signed Rank Test indicated statistically significant enhancements, suggesting that Blooket may enhance intrinsic motivation by providing engaging and interactive learning experiences. Digital game-based learning was also found to reduce external stresses, cultivating a conducive atmosphere for language acquisition. The study offers insights for incorporating Blooket into English as a Foreign Language (EFL) settings to enhance motivation and engagement.

Keywords: *Autonomous Motivation; Game-Based Learning; Digital Learning Platforms; EFL Motivation; Self-Determination Theory*

Introduction

Motivation plays a crucial role in achieving classroom success. It can be cultivated in various ways, either intrinsically (originating from the students themselves) or extrinsically (driven by external factors). According to self-determination theory, externally controlled motivation can be internalized, ultimately leading to stronger and more fulfilling intrinsic motivation (Ryan & Deci, 2000, 2018). One effective way to foster student motivation is through innovative teaching strategies. In contemporary education, the integration of technology has become prominent. Research highlights that technology integration enhances students' motivation in English language teaching (Carstens et al. 2021; Panagiotidis, Krystalli, and Arvanitis 2023; Zen et al., 2022).

Technology has been integrated into teaching and learning to create successful classrooms. In education, it supports the new teaching paradigm (Prensky, 2008). Moreover, technology shapes students'

values and identities (Cloete, 2017). By utilizing digital tools, educators may improve engagement, foster collaboration, and offer access to an extensive range of resources. These improvements enhance the educational experience and provide students with vital digital competencies for contemporary society.

A notable trend in this digital age is the integration of game-based learning. Integrating technology and game-based approaches has become a trend and core in teaching today. Game-based plays a significant role in active learning, information retention, and attainment of competencies (Dabbous et al., 2022). In addition, the role of game-based learning establishes students' engagement and educational gaming content interaction (Adipat et al., 2021).

Game-based learning is one of the more original uses in English Language Teaching (ELT), where games being utilized draw students into deep involvement with enjoyable interactive and immersive activities. Not only does game-based learning make language practice fun, it enhances practical vocabulary and literacy through its commitment to their growth in context that is actually appealing for gamers. Research has shown that the method can enhance academic performance (Aziz et al., 2018; Fuster-Guilló et al., 2019; Pando Cerra et al., 2022), raise intrinsic motivation among learners (Akour et al., 2020; Pando Cerra et al., 2022; Partovi & Razavi, 2019), promote collaboration amongst students as well as create a positive learning environment (Hartt et al., 2020; Saleh et al., 2020; Turchi et al., 2019). Games in ELT can transform the way we learn by making it more exciting and promoting critical thinking, problem-solving skills and real-world communication, reinforcing long-term retention eye playing two lights out of content. With the rise of digital tools in education, game-based learning has moved beyond traditional activities to online platforms, which offer enhanced flexibility and variety in teaching and learning experiences.

Technology and game-based learning have emerged as potent tools for enhancing student engagement and classroom interaction. Platforms such as Blooket and Wordwall illustrate the integration of game-based technology with educational practices and social gamification to foster exciting learning experiences. Blooket has been demonstrated to enhance the beliefs, attitudes, and perceptions of TESL trainee teachers (Khalip, et al., 2023) while promoting critical thinking and motivation among students while promoting critical thinking and motivation among students (Rungsawang & Pookcharoen, 2023; Sartika et al., 2023). Notwithstanding several obstacles in its execution, including technical constraints and user adaption (Hasan & Habibie, 2024). research supports its suitability for English language training (Masruroh, 2024). Another example is Wordwall, an interactive platform that supports active engagement (Widhiatama and Brameswari, 2024), and fosters active involvement by facilitating information retention through repeated exposure and interaction (Arsyad, 2024). Additionally, the interactive components correspond with motivational theories, providing students with a sense of accomplishment and satisfaction when completing game-based activities (Dhaifi et al., 2024). Together, these platforms highlight the revolutionary potential of game-based learning to promote engagement, motivation, and skill development in education.

The combination of technology and games has been documented as fostering students' motivation in class. For instance, a study investigated students' perceptions and motivations towards ESL lessons through Kahoot and Quizziz. This study shows that fun, enjoyment, and competition reflected their positive motivation and perception (Abdul Halim et al., 2020). A study examined and reviewed how digital game-based learning can affect students' motivation. It reveals that this combination approach can affect students' motivation to learn English (Razali et al., 2023).

Based on the need analysis, the context of English language teaching in a junior high school, Sleman, identified students' lack of motivation. It was added that they are interested in technology and interactive learning. Moreover, this study fills the gap in methodologies and context, where it was conducted in classroom action research at the university level (Phuc Luong Huynh, 2024). Further information based on NA shows that students are delighted to learn in exciting ways, such as through competition and stunning visuals. While technology and game-based learning have the potential to be applied in English language teaching, they require thorough investigation and empirical validation. Thus,

this study aims to describe the significant motivation types distribution among the students by employing game-based learning. Additionally, it examines the effectiveness of game-based learning in enhancing junior high school students' motivation to learn English, using the perspective of SDT.

This study contributes significantly to exploring the potential of digital game-based learning as a transformative approach to English language teaching in Junior high schools in Indonesia. In particular, how digital game-based learning like Blooket and Wordwall has the potential to enhance learners' motivation. this research explores how a digital game-based platform can foster autonomous motivation through the lens of self-determination theory. Hence, the research questions addressing the scope of the study are as follows: 1) What is the distribution of significant motivation types (autonomous, and controlled) among EFL students using game-based learning? 2) How effective is game-based learning in increasing students' motivation?

Research Hypothesis

H0: Digital Game-based learning has no significant effect on increasing students' motivation.

H1: Digital Game-based learning significantly increases students' motivation.

Research Methods

This study employed a quasi-experimental framework to evaluate the impact of Blooket on boosting motivation in EFL learners. Due to the context of the study in an educational setting, this design is recommended to apply experiments outside the laboratory or natural setting by giving intervention to the variables (Cohen 2018). The investigation centered on the utilization of digital platforms Blooket and Wordwall, incorporating aspects of gamification into the process of learning English. The design enabled a thorough comparison between a group engaged in Game-based learning activities and a control group adhering to traditional instructional methods. This study aims to determine whether game-based learning significantly affects students' motivation.

The primary instrument used in this study is the adaptation of the SRQ-L instrument from William and Deci (1996) for learning English vocabulary through digital game-based learning. This questionnaire survey was used to identify the degree or regulation of students' motivation before and after receiving treatment using digital game-based learning. It has 4-point Likert-type scale items, in which an item was removed, 'neutral'. All items were written to seek out the students' motivation types, which are autonomous or controlled motivations. Face validity is achieved when an expert evaluates the questionnaire items and concurs that the test is a valid measure of the concept under evaluation (Dunn, 2020). The researcher modified the questionnaire from [saha] prior study and secured expert validation to confirm that it accurately represented the core concept of the investigation. Clark and Watson (2019) assert that content validity evaluates the extent to which an instrument accurately measures a specific subject matter. The Statistical Package for Social Purpose (SPSS) serves as a critical instrument used for rigorous statistical analyses, including the Wilcoxon test, to evaluate the effectiveness of digital game-based learning on educational outcomes since the subscale items of controlled motivation are not normally distributed. This game-based learning was employed to engage, interest, and drive the students to learn English vocabulary. Additionally, a semi-structured interview was added as supplementary data in which addressing to the teacher and four students.

The analysis of data was conducted utilizing SPSS software. The Wilcoxon Signed Rank Test was utilized because of the non-normal distribution observed in the pre-test scores, and descriptive statistics were employed to summarize the motivation levels. The reliability of the autonomous and controlled motivation scales was confirmed using Cronbach's alpha. The analysis sought to explore the importance and impact of Game-based learning on student motivation.

The quasi-experiment adopted a systematic approach to assess the effects of game-based learning on vocabulary acquisition in procedural texts. The research began with a needs analysis, which revealed students' low engagement and motivation in vocabulary lessons. Second, this intervention incorporated gamified learning tools, specifically Blooket and Wordwall, in most digital game-based learning activities. The intervention attempted to improve student motivation via interactive, technology-driven activities. A pre-test was conducted to evaluate students' baseline motivation levels using SRQ-L before the treatment. Third, the treatment phase comprised two weekly sessions during which students participated in game-based learning activities designed to teach vocabulary in procedural texts. After that, A post-test was conducted following the intervention to assess the effectiveness of the approach in enhancing motivation. Next, the data were analyzed with SPSS software, utilizing statistical tests to assess changes in motivation. Finally, the findings were analyzed and presented, offering a thorough understanding of the effects of game-based learning on EFL learners' motivation in vocabulary acquisition.

Results and Discussion

This section outlines the findings obtained from the quantitative and qualitative analyses, aiming to address the research questions concerning the impact of digital game-based learning on EFL learners' motivation. The data are interpreted through the lens of Self-Determination Theory (SDT), focusing on the distribution and development of autonomous and controlled motivation. The results are further contextualized by comparing them with previous literature, highlighting how game-based platforms like Blooket and Wordwall influence students' motivational orientations in English language learning.

A. Result

1. The Distribution of Students' Motivation Types in Using a Game-Based Learning Approach

This quantitative study started with a pre-test to assess students' motivation in game-based learning. The questionnaire was spread between the 12th and 16th sessions. The inquiry primarily examined the impact of digital game-based learning on students' autonomous vs. controlled motivation. Prior to this statistical technique, the subscales and items were assessed for validity and reliability. The validity of each item is displayed in Table 1. The validity test was conducted to assess the extent to which each item in the scale has a correlation with the respective scale total. Validity was tested using Pearson's correlation between item scores and total scores on two subscales, namely Autonomous Regulation (AR) and Controlled Regulation (CR). The analysis showed that all items had significant correlations with their respective scale totals (p<0.05, p<0.05). In the AR subscale, the correlation of items with the total scale ranged from 0.334 to 0.746, where all items had correlation values above 0.3-0.7, so they can be categorized as valid (De Vaus, 2015). However, item ARQ3 has the lowest correlation (r=0.334r=0.334), which is still within the minimum limit of validity, but can be considered for revision or further analysis to improve the quality of the scale. Meanwhile, on the CR subscale, the correlation of the items with the total scale ranged from 0.395 to 0.754, which also met the validity criteria. However, items CRQ10 and CRQ12 have lower correlations (r=0.395 r=0.395 and r=0.436 r=0.436), so they can be considered for improvement in future research. Overall, the results of the validity test showed that all items in both subscales had a fairly strong relationship with the total scale, making them suitable for use in further analysis.

Table 1. Autonomous Regulation (AR) and Controlled Regulation (CR) Subscales Validity Result

Item	R	Sig. (p)	Description
ARQ1	.685	.5	Valid
ARQ3	.578	.5	Valid
ARQ6	.696	.5	Valid
ARQ9	.723	.5	Valid
ARQ11	.746	.5	Valid
ARQ13	.589	.5	Valid
ARQ14	.675	.5	Valid
CRQ2	.754	.5	Valid
CRQ4	.542	.5	Valid
CRQ5	.476	.5	Valid
CRQ7	.490	.5	Valid
CRQ8	.658	.5	Valid
CRQ10	.395	.5	Low but Valid
CRQ12	.436	.5	Low but Valid

The Cronbach alpha values for each subscale of the motivation questionnaire are presented in Table 2. A reliability analysis was conducted to examine the internal consistency of the Self-Regulation Learning Questionnaire, which consists of 14 items. The overall Cronbach's Alpha was 0.810, indicating good reliability and suggesting that the scale is internally consistent (Cohen, Manion, and Morrison, 2013). Item-total statistics showed that most items had corrected item-total correlations above 0.3, supporting their contribution to the overall scale. However, ARQ3 had a lower item-total correlation (0.337), which falls slightly below the commonly accepted threshold of 0.4, indicating that it may weakly contribute to the scale's reliability. Despite this, Cronbach's Alpha value remained stable even when individual items were removed, as seen in the "Cronbach's Alpha if Item Deleted" column, where values ranged between 0.782 and 0.821. This suggests that removing any item would not substantially improve overall reliability. Based on these findings, the scale demonstrates good internal consistency, and while minor adjustments such as reviewing or modifying ARQ3 could potentially enhance reliability, the overall structure remains strong for measuring self-regulation in learning.

Table 2. Reliability Analysis of Self-Regulation Learning Questionnaires

Items	Corrected Item-Total Correlation	Cronbach's Alpha if item Deleted
ARQ1	.566	.787
ARQ3	.337	.805
ARQ6	.543	.790
ARQ9	.562	.790
ARQ11	.670	.782
ARQ13	.381	.802
ARQ14	.623	.787
CRQ2	.536	.790
CRQ4	.259	.813
CRQ5	.504	.793
CRQ7	.213	.818
CRQ8	.505	.793
CRQ10	.112	.821
CRQ12	.427	.799

A descriptive analysis investigated the distribution of motivation types among junior high school students, highlighting their motivation for engaging with game-based learning. The means and standard deviations for the Autonomous and Controlled motivation subscales are presented in Table 3. It indicates that the mean score for autonomous motivation was higher, recorded at 3.428. At the same time, the average score for controlled motivation was lower (2.852).

Table 3. Descriptive Statistics of Autonomous and Controlled Motivation

Dependent Variable	SD	Means	Percentage
Autonomous motivation	3.52	3.43	55%
Controlled motivation	3.53	2.85	45%

The mean score for autonomous motivation was 3.43, with a standard deviation of 3.52, representing 55% of the total motivation assessed. This suggests that the majority of participants were primarily driven by intrinsic factors, including personal interest, enjoyment, or the perceived significance of the learning activity. Controlled motivation exhibited a mean score of 2.85 and a standard deviation of 3.53, accounting for 45% of the overall motivation.

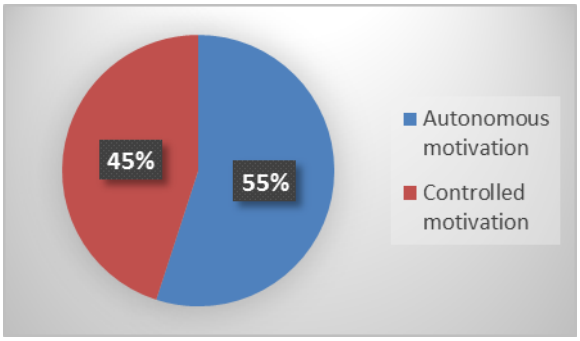

Fig. 1. Students' Motivation Types

This variation highlights the necessity of customizing educational strategies to foster intrinsic motivation, frequently linked to enhanced engagement and improved learning outcomes.

Table 2.1. Descriptive Statistic Item Scales

Items	Min	Max	SD	Mean
Autonomous motivation				
Q1 (*"I find Digital Games a fun way to improve my English vocabulary and grammar."*)	1.00	4.00	.672	3.42
Q3 (*"Learning English is important for my development and my future."*)	3.00	4.00	.445	3.74
Q6 (*"I believe that playing Digital Games helps me understand English better."*)	2.00	4.00	.564	3.42
Q9 (*"Doing well in Digital Games is important to improve my English skills."*)	3.00	4.00	.486	3.35
Q11 (*"Fun learning new English words and grammar through games."*)	3,00	4,00	.508	3.48
Q13 (*"The challenge of answering questions quickly and correctly in the game intrigued me."*)	2.00	4,00	.529	3.29
Q14 (*"I find learning English more interesting through fun activities in Digital Games."*)	3.00	4,00	.461	3.29
Controlled motivation				
Q2 (*"Others will think badly of me if I don't learn well through*	1.00	3.00	.631	2.26

Digital Games.")				
Q4 (*"I would feel bad about myself if I didn't try hard when learning through Digital Games."*)	2.00	4.00	.654	2.81
Q5 (*"I will get more points and rewards in the Digital Games if I do well."*)	1.00	4.00	.729	3.26
Q7 (*"I want others to see that I am good at English and at learning through Digital Games."*)	1.00	4.00	.693	2.71
Q8 (*"It is easier to follow the instructions in the Digital Game than to create your own learning strategy."*)	2.00	4.00	.562	2.87
Q10 (*"I will feel guilty if I don't follow the strategies given in Digital Games to win."*)	2.00	4.00	.564	2.58
Q12 (*"I will feel proud if my English skills improve by playing Digital Games."*)	3.00	4.00	.508	3.48

As seen in Table 2.1, the analysis of autonomous motivation items (Q1, Q3, Q6, Q9, Q11, Q13, Q14) demonstrated mean scores ranging from 3.23 to 3.74, suggesting a prevalent inclination towards higher intrinsic motivation among students participating in digital game-based learning. Item Q3, "*Learning English is important for my development and my future*" (mean = 3.74, SD = 0.445), exhibited the highest mean, indicating that students acknowledge the long-term significance of English proficiency. Q11 states, "*I find learning new English vocabulary and grammar through digital games fun*" (mean = 3.48, SD = 0.508), indicating students' appreciation for the interactive components of digital games as a learning tool.

The item exhibiting the lowest mean in the context of autonomous motivation was Q14, "*I find learning English more interesting through fun activities in Digital Games*" (mean = 3.29, SD = 0.461). This suggests a minor variation in interest regarding time-pressured or competitive elements of game-based learning, despite remaining relatively high. The standard deviations for autonomous motivation items are low, indicating consistent agreement among participants about the intrinsic value and enjoyment of digital games in improving their English skills.

The controlled motivation items (Q2, Q4, Q5, Q7, Q8, Q10, Q12) exhibited a mean score range of 2.58 to 3.48, indicating a moderate dependence on external motivators among students. The item with the highest mean, Q12, "*I will feel proud if my English skills improve by playing digital games*" (mean = 3.48, SD = 0.508), demonstrates that pride in skill enhancement serves as a notable external motivator. In contrast, Q2, "*Others will think badly of me if I don't learn well through digital games*" (mean = 2.26, SD = 0.630), exhibited the lowest mean score, indicating that peer judgment is a less significant motivator for students in the game-based learning environment.

The rise of digital technologies has further amplified the importance of multimodality in education. The Digital Period has ushered in an era where text, images, videos, and sound are seamlessly integrated, enabling new forms of communication and expression (Jewitt, 2009a). In EFL classrooms, digital tools such as multimedia presentations, online collaborative platforms, and interactive apps provide opportunities for students to practice language skills in authentic, multimodal contexts. These technologies not only enhance language learning but also prepare students to navigate the multimodal communication environments they will encounter in higher education, the workplace, and beyond.

2. The Effectiveness of the Game-Based Learning Approach in Fostering Students' Autonomous Motivation

This section explains how effective Game-based learning can enhance motivation after utilizing the approach. This paper provides a comparison between pre-test and post-test results. Before analysing the comparison of pre- and post-test results, the normality of the distribution must be checked. Table 3 shows the results of the normality test on the scales. To verify that the pre-test and post-test scores

conform to a normal distribution, both the Kolmogorov-Smirnov and Shapiro-Wilk tests were performed. The significant values (p-values) for each test are presented in Table 3.

The Kolmogorov-Smirnov test for pre-test scores produced a statistic of 0.159 with a significance level of p=0.046, while the Shapiro-Wilk test provided a statistic of 0.925 with p=0.032. Given that both p-values are below the standard alpha threshold of 0.05, we infer that the pre-test scores significantly differ from a normal distribution. The post-test results exhibited no substantial divergence from normality. The Kolmogorov-Smirnov test statistic was 0.145 with p=0.097, whereas the Shapiro-Wilk test produced a value of 0.952 with p=0.177. Both p-values are above 0.05, suggesting that the post-test results correspond to a normal distribution.

Table 3. Test of Normality

	Kolmogorov-Smirnov Sig.	Shapiro-Wilk Sig	N
Pre-test	.046	.032	31
Post-test	.097	.177	31

The pre-test results fail to satisfy the assumption of normality, but the post-test scores do. This information will be incorporated into future analysis, as the selection of statistical tests may be influenced by the data's normality. Thus, it was analysed using a nonparametric test, the Wilcoxon test.

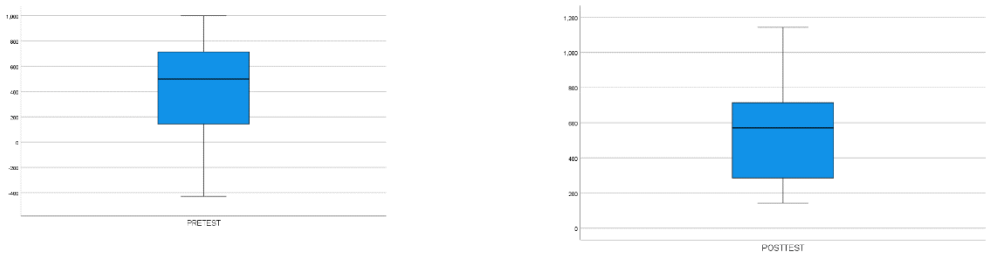

Fig. 2. Pre-test and Post-test Boxplot

As seen in Fig. 2., On the pre-test, the median student score was around 500, with an inter-quartile range (IQR) of 400 to 600. The minimum score was recorded at -400, while the maximum score reached 1000. After the intervention, the post-test results showed a positive improvement. The median student score increased to around 600, with a wider IQR from 500 to 800. The minimum score also increased significantly to 200, whereas the maximum score increased to 1200. This figure displays the median distribution between pre-test and post-test. thereby, this information will be valuable when performing the Wilcoxon test analysis to determine the median, IQR, outliers, and visualize the data.

A Wilcoxon Signed Rank Test was used to assess the effectiveness of the Game-based learning method on student motivation by comparing pre-test and post-test results. As the normality tests showed, the pre-test scores failed to comply with a normal distribution, so the non-parametric Wilcoxon Signed Rank Test was considered suitable for this study.

Table 4. The Results of Wilcoxon Test

Test Statistic	Standardized Test Statistic	p-value (2-tailed)
263	2.24	.025

The Wilcoxon Signed Rank Test yielded a test statistic of 263.00, a standard error of 39.083, and a standardized test statistic of 2.239. The two-sided asymptotic significance was p=0.025, which is below

the standard alpha threshold of 0.05. Consequently, the null hypothesis asserts that the median difference between pre-test and post-test scores is rejected.

B. Discussion

The findings point out that digital game-based learning significantly improves autonomous motivation in junior high school students, evidenced by a higher mean score for autonomous motivation (3.43) relative to controlled motivation (2.85). This indicates that students are primarily motivated by intrinsic factors, including personal interest, enjoyment, and the perceived value of English proficiency for personal development and career progression. The highest mean score for autonomous motivation was linked to item Q3 ("Learning English is important for my development and my future"), indicating that students acknowledge the long-term importance of English proficiency. The findings support self-determination theory (SDT), highlighting that the recognition of value is essential for promoting and maintaining intrinsic motivation (Ryan and Deci, 2000). It is supported by previous study that students realized the importance of English for their future, such as continuing study abroad at university or their future career (Ye, 2021).Students indicated enjoyment of the interactive elements of digital games, as evidenced by item Q11, thereby reinforcing the idea that game-based learning enhances the enjoyment and engagement of language learning. Low standard deviations in autonomous motivation items indicate a consistent acceptance among students, supporting the perspective that game-based learning serves as an intrinsically motivating method. It supports findings from previous studies that game-based learning entices enjoyment and emotional involvement that lead to intrinsic motivation (Hartt et al., 2020).

Controlled motivation, in contrast, exhibited a moderate, secondary influence, with mean scores for controlled motivation items varying between 2.58 and 3.48. The highest mean in this category was observed for item Q12 ("I will feel proud if my English skills improve by playing digital games"), indicating that pride in achievement serves as a notable external motivator. This finding corresponds with introjected regulation in Self-Determination Theory, wherein students internalize specific external motivators, including pride and self-esteem. The low mean for item Q2 ("Others will think badly of me if I don’t learn well through digital games") suggests that peer judgment is not a significant motivator. This indicates that digital game-based learning mitigates social pressures and fosters a supportive, low-stakes environment. The results demonstrate a balanced motivational profile, characterized by autonomous motivation as the primary driver, with controlled motivation providing additional support. It leads students to acquire high-quality profiles, which means dominated by high autonomous motivation and low controlled motivation (Oga-Baldwin & Fryer, 2020). This balance highlights the effectiveness of game-based learning in engaging students by integrating personal interest and development with appropriate external motivators, positioning it as a viable strategy for improving motivation in language learning environments.

The effectiveness of game-based learning in fostering autonomous motivation was assessed by a pre-test and post-test comparison. Preliminary normality testing indicated that pre-test scores considerably varied from a normal distribution, implying diversity in students' initial motivation levels. Conversely, post-test results had a normal distribution, suggesting a more consistent response after engagement with game-based learning.

An analysis of pre-test and post-test data from 31 students indicated a significant increase in motivation after the game-based learning intervention. The pre-test results indicated a median score of around 500, with an interquartile range (IQR) from 400 to 600. The minimum score recorded was -400, signifying extremely low motivation among certain students, whereas the maximum score attained was 1000, indicating elevated motivation levels in others. Following the intervention, the post-test median rose to approximately 600, accompanied by an expanded interquartile range of 500 to 800, signifying increased variability in motivation levels. The minimum score increased to 200, indicating that students with the lowest motivation exhibited improvement. In contrast, the maximum score rose to 1200, reflecting the existence of students who attained high motivation following the intervention. The increase in the median score by 100 points, along with enhancements in both minimum and maximum scores,

indicates the effectiveness of game-based learning in improving student motivation. The distribution of post-test scores reveals that the intervention's impact varied, with some students demonstrating substantial improvement and others exhibiting minimal gains. The variance indicates that personal factors may affect students' responses to game-based learning. The findings indicate that game-based learning can enhance motivation; however, supplementary strategies may be necessary to achieve uniform student benefits. Further research is advised to investigate these individual factors and to create more adaptive learning methodologies.

Due to the non-normality of the pre-test data, the Wilcoxon Signed Rank Test was selected as the suitable non-parametric method to evaluate variations in motivation. The test result (p=0.025) indicates a statistically significant enhancement in motivation from pre-test to post-test, hence rejecting the null hypothesis. This indicates that game-based learning significantly enhanced student motivation, especially for autonomous motivation. As suggested by previous research, English teachers in public schools should create engaging, interactive learning environments that can boost motivation (Luele, 2023). Additionally, learning English by containing authentic language experiences (Davis & Bowles, 2018), challenging and encouraging activities (Sabboor Hussain et al., 2020), and improving a pleasurable educational experience (Lasala Jr, 2024).

The statistically substantial improvement in pre- and post-test scores supports the notion that game-based learning is an effective mechanism for boosting motivation and may also promote self-regulation by aligning with students' intrinsic motivational orientations. In line with Gee and Price (2021) is associated with gaming features that emphasize intrinsic motivation in educational platforms. Moreover, it aligns with Razali et al. (2023) that game elements can support students' intrinsic motivation from point construct. Furthermore, as game-based learning incorporates technology, this finding corresponds with Warni, Aziz, and Febriawan (2018) that technological use can enhance learner autonomy, a component of intrinsic motivation.

Conclusion and Suggestions

The present research verifies that digital game-based learning significantly boosts autonomous motivation in junior high school students, primarily influenced by intrinsic variables like personal interest, enjoyment, and the projected long-term advantages of English proficiency. The findings indicate that students acknowledge the significance of English for their personal and professional advancement and engage deeper with language acquisition through interactive digital gaming components. The increase in motivation from pre- to post-test highlights the capacity of game-based learning to enhance both motivation and self-regulation. Thus, this study offers practical insights for educators to use game-based learning supports that align with the concepts of self-determination theory. This technique fosters self-regulated learners equipped for lifetime learning and global competitiveness.

Despite its encouraging outcomes, this study possesses shortcomings that further research might resolve. The sample size was limited to one junior high school, perhaps limiting generalizability to larger groups. Furthermore, motivation was assessed exclusively by self-reported questionnaires, potentially introducing bias. Future research may investigate the enduring impacts of game-based learning on motivation and language retention, assess its influence across varied student demographics, and incorporate observational or qualitative data such as adding interviews as data sources to enhance comprehension of student involvement. Furthermore, future study is recommended to explore the individual factors so that the methodologies can be adaptable to various students' characteristics. The findings suggest that educators may boost motivation and engagement in language courses by integrating interactive, technology-based tools, potentially applicable across diverse educational areas and age demographics.

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