Digital game-based learning: A catalyst for EFL self-efficacy among Indonesian vocational students

Nurul Aminatus Zuhriya[1], Yuliyanto Sabat[1], Laili Hibatin Wafiroh[1]

[1] Universitas PGRI Delta Sidoarjo, East Java, Indonesia, 61234
Corresponding author, email: mrs.amysmeknesa@gmail.com

Article History
Received: December 29, 2025
Revised: January 18, 2026
Accepted: January 31, 2026

Keywords
Digital Game-Based Learning; EFL Self-Efficacy; Indonesian EFL Context; Vocational Education

Abstract
While student engagement often is unstable in vocational EFL settings, Digital Game-Based Learning (DGBL) offers a dynamic solution through its interactive framework. This study evaluates how the Wayground platform serves as a catalyst for boosting self-efficacy among Indonesian vocational students. Using a pre-experimental one-group pretest-posttest design, we observed 36 tenth-grade students majoring in Pharmaceutical Engineering at SMK Negeri 1 Sampang (Academic Year 2025/2026). Data collection relied on an EFL self-efficacy questionnaire paired with authentic Wayground activity logs. Statistical analysis was conducted using the Paired-Samples T-test, which indicated a significant increase in self-efficacy ($t(35) = -17.955$, $p < 0.001$) with a large effect size (Cohen's $d = 2.99$). The findings indicate that the use of Wayground-based DGBL is associated with a substantial increase in vocational students' EFL self-efficacy. These results suggest that gamified learning environments may offer a promising pedagogical alternative for fostering self-efficacy among vocational EFL students

How to Cite: Zuhriya, N. A., Sabat, Y., & Wafiroh, L. H. (2026). Digital game-based learning: A catalyst for EFL self-efficacy among Indonesian vocational students. *Jurnal Inspirasi Pendidikan, 16*(1), 45-56. https://doi.org/10.21067/jip.v16i1.13664

1. Introduction

Learning English for vocational students is a multifaceted challenge. The underlying cause is that vocational students in Indonesia also struggle with language learning, as they are not exposed to English as a Foreign Language (EFL) much in their real-world work. This challenge is partly attributed to the marginalization of English instruction as vocational curricula prioritize technical competency over linguistic proficiency. Consequently, restricted vocabulary and mispronunciation become key obstacles that hinder students from speaking English fluently (Octaberlina et al., 2022; Purwati et al., 2023). Hence, the myriad of ambiguities in English word order and grammar confuse students on how to speak English fluently (Menggo et al., 2025; Wulandari et al., 2021).

Beyond these technical issues, vocational students face profound affective challenges. The discrepancy between their technical focus and the required foreign language competence often triggers a high affective filter, manifesting as anxiety and feelings of inadequacy. To address these psychological barriers, self-efficacy is defined as an individual's judgment of their capability to organise and execute the courses of action required to attain designated levels of performance (Sirojuddin, 2024; Zhuang, 2023). Previous research also suggested that students' self-efficacy can improve learning outcomes and motivate them to work harder, especially in learning English. It is a major determinant of academic success in English learning, as students with high self-efficacy are more likely to achieve better academic results and be more motivated (Anam & Stracke, 2020; Teng et al., 2023). One's belief in self-efficacy has an immediate effect on one's motivation to learn and was the best predictor, among others, of academic success in school, in a study that included Jordanian EFL students (Alogiliy, 2024). Therefore, researchers consider building self-efficacy to be urgent as a psychological foundation that enables students to control their fear of failure and turn it into motivation to try. With strong self-efficacy, students no longer

https://doi.org/10. 21067/jip.v16i1.13662

ISSN 2088-9704 (print) | 2549-4147 (online)

view English as an academic burden, but rather as a tool to support their professional careers.

Educators have explored various innovative pedagogical strategies to cultivate this vital self-efficacy. The integration of Digital Game-Based Learning (DGBL) via the Wayground platform is one promising approach. This methodology is strategically chosen because it offers a low-risk environment in which students can engage in trial-and-error without fear of public failure (Kazu & Kuvvetli, 2023; Liu et al., 2025). By shifting the focus from formal evaluation to immersive gameplay, DGBL effectively lowers the students' affective filter, reducing the language anxiety commonly found in vocational settings.

To understand how DGBL specifically influences vocational students, it is essential to examine the four primary sources of self-efficacy (Bandura, 1997; Resnick, 2023; Schunk & DiBenedetto, 2021). First, mastery experiences are facilitated through Wayground's tiered challenges. By completing linguistic tasks, students achieve micro-wins. These repeated successes provide authentic evidence of their capabilities (Teng et al., 2023). This experience is gradually replacing their history of academic struggle with a sense of competence. Second, vicarious experiences occur through the platform's social and avatar-based features. When vocational students observe their peers with similar backgrounds and challenges successfully navigating English tasks on the leaderboard, it fosters the belief that they can achieve similar success (Alogiliy, 2024). Third, verbal persuasion is integrated through the platform's instant feedback mechanism. When students complete tasks, Wayground provides immediate positive reinforcement and encouragement. This application serves as digital verbal support to strengthen their belief in their abilities. This constant validation is crucial for vocational students who lack encouragement in traditional environments (Mantooth et al., 2021; Rayyan et al., 2024). Fourth, DGBL addresses physiological and affective conditions by transforming the stressful exam environment into a low-stress, enjoyable experience. It reduces physical symptoms of stress, such as racing thoughts or hesitation, by replacing them with the excitement of playing games. Students can approach English learning with a more positive emotional state, which, in turn, strengthens their self-efficacy (Teng, 2024; Zhao, 2022).

On top of that, Wayground serves as a medium for verbal persuasion by providing immediate, constructive feedback. Unlike traditional classroom environments, feedback may be delayed or anxiety-inducing; the automated reinforcements and rewards in the game act as continuous social persuasion that encourages persistence (Khaldi et al., 2023). The platform addresses students' physiological and affective states. The vocational students often associate English with high levels of anxiety. This anxiety often acts as a significant barrier to learning; however, the immersive, ludic (playful) nature of Wayground reduces this affective filter, lowering stress levels and fostering a positive emotional state (Yu & Abdullah, 2025). By optimising these four sources, Wayground creates a holistic psychological environment that builds vocational students' confidence in using English in professional contexts.

Wayground represents a significant digital evolution of the Quizizz platform, transitioning from a conventional question-and-answer interface to a sophisticated environment. This platform facilitates Digital Game-Based Learning (DGBL) by offering an immersive Wayground. Students can navigate virtual spaces to complete linguistic challenges. Unlike Quizizz, Wayground emphasizes spatial engagement and contextualized tasks, which are crucial for vocational students who need practical application of English. By lowering performance anxiety and providing immediate feedback through interactive game elements, such as badges and real-time rewards, Wayground creates a safe space for students to build their self-efficacy and linguistic competence simultaneously. Empirical evidence suggests that students who learned vocabulary with Quizizz significantly outperformed those in the traditional instruction group (Kazu & Kuvvetli, 2023). In addition, educators can promote students' motivation by introducing game components such as point systems, badge rewards, and leaderboards into the learning process to create a sense of competitiveness and positive emotions in learning (Khaldi et al., 2023).

Previous Research shows that implementing DGBL, such as the Wayground platform, in English-language instruction in vocational schools can significantly enhance students' self-efficacy, thereby improving their language competence and workplace confidence. For example, a Chinese study of struggling vocational students found that listening games were highly effective in improving listening skills and motivation to learn, thereby building self-efficacy in learning (Yu & Abdullah, 2025). In addition, according to Setyowati et al. (2025), the game-based approach in English language learning in vocational schools significantly improved students' test scores compared to the traditional lecture method.

However, in vocational education, the benefits of Wayground as DGBL on self-efficacy and language proficiency among EFL students remain largely unexplored. Most Research focuses on EFL contexts in general or specific groups, such as disadvantaged students, whereas Research on language proficiency in vocational education settings is scarce (Jia et al., 2025). Furthermore, although many studies have examined various DGBL tools and ways, none have examined or discussed Wayground (Chu et al., 2023; Liu et al., 2025).

Responses to DGBL have not been thoroughly investigated due to the diverse vocational backgrounds of EFL students. Cabrera-Solano (2022) highlights that Research often groups EFL students learning English without distinguishing the specific vocational field or career path they pursue. Comparative Research is necessary to investigate how students from various vocational backgrounds, such as engineering, business, or health, engage with DGBL and determine whether vocational training can affect DGBL acceptance and effectiveness (Bakan et al., 2022). In addition, much of the Research on this topic has been conducted in public schools or universities, leaving a gap in information on how to implement it in vocational training institutions effectively (Pan et al., 2025).

This study is essential, as the self-efficacy of Indonesian EFL students at vocational high schools should be significantly improved to acquire English skills and be ready to work. Given the numerous obstacles to studying English, educators should implement highly engaging, innovative approaches. While much of the previous research on DGBL has been conducted in general public schools or universities, leaving a gap in information on how to implement it in vocational training institutions effectively (Dahalan et al., 2024), this study addresses this gap by specifically using Wayground, a novel DGBL platform tailored to the unique psychological and technical needs of vocational students. Unlike standard gamified tools, Wayground's immersive spatial design offers a distinct pedagogical approach to fostering self-efficacy in a specialized vocational context. Based on the identified gaps, this study aims to examine the extent to which the implementation of Wayground-based Digital Game-Based Learning is associated with changes in the self-efficacy of Indonesian vocational high school students in learning English as a Foreign Language. Accordingly, this study hypothesizes that there is a statistically significant difference in students' EFL self-efficacy scores before and after the implementation of Wayground-based Digital Game-Based Learning. Therefore, this study offers promising implications for enhancing curriculum and pedagogy in vocational education, particularly in EFL.

2. Method

2.1. Design

This study employed a one-group pre-test and post-test pre-experimental design. Specifically, this study falls under the pre-experimental design category, as it involves a single group observed before and after the treatment without a control group for comparison (C.-A. Chen et al., 2021). This design was intentionally selected to evaluate the preliminary impact of the Wayground platform within an intact class setting, where practical and administrative constraints precluded the use of a randomized control group. This approach was chosen to measure the catalytic effect of Digital Game-Based Learning (DGBL) on students' self-efficacy by comparing baseline data with post-intervention results.

Integrating self-reported questionnaires and objective digital activity logs enabled us to triangulate data sources for validity (Stamenkov, 2023).

2.2. Participants and Procedure

The respondents were 36 tenth-grade students majoring in Pharmaceutical Engineering at SMK Negeri 1 Sampang, Indonesia, during the 2025/2026 academic year. One intact class was purposively chosen with high language anxiety and little exposure to English-speaking practices in vocational contexts.

The intervention procedure was carried out over four weeks, divided into eight sessions (90 minutes per session). The intervention followed a Quest-based learning flow divided into three main phases. The first phase was the diagnostic stage, during which students completed a pre-test questionnaire and received orientation on navigating the Wayground platform. The second phase is the implementation stage, during which English procedural text material is delivered through Wayground. In this phase, the four pillars of self-efficacy are activated: students complete tiered missions to build a sense of competence, observe their peers' progress through a leaderboard (vicarious), receive instant feedback from the system (persuasion), and learn in a fun environment to reduce stress (physiological conditions). The final phase is the evaluation stage, during which students complete a post-test questionnaire, and researchers extract activity log data from the system. The research was divided into three phases: diagnostic, implementation, and evaluation, as shown in Figure 1.

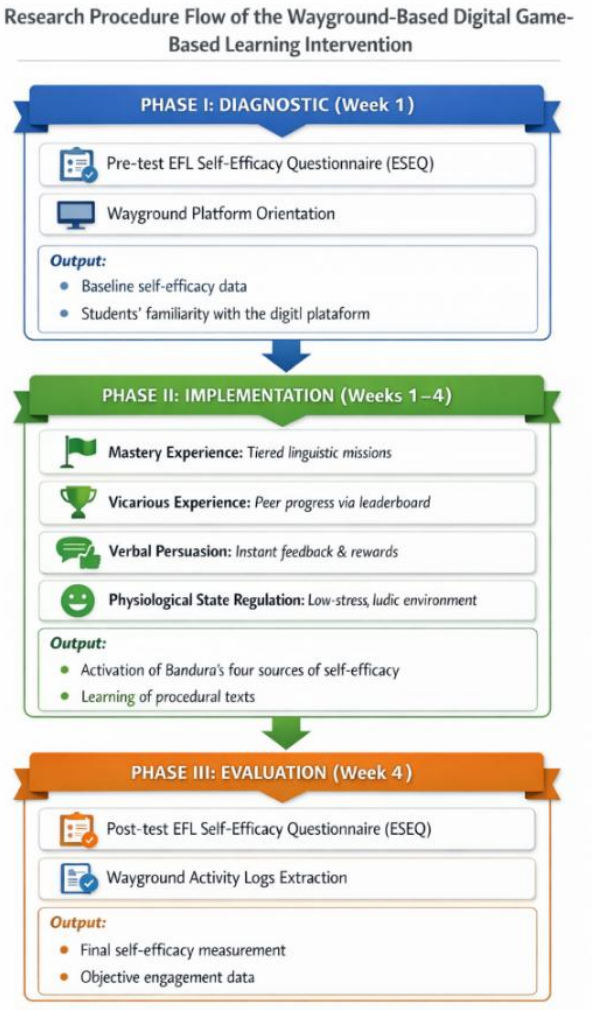

Figure 1. The Three-Phase Research Procedure: Transitioning from Diagnostic to Evaluation

2.3. Instruments

The research data were gathered using two main tools to provide the broadest reflection of the self-efficacy enhancement process. The first questionnaire was the EFL Self-Efficacy Questionnaire (ESEQ), comprising 30 items measured on a 5-point Likert scale. This questionnaire was modified from Bandura's (2006) validation scale, with items specifically formulated for the four sources of self-efficacy: mastery experience, vicarious experience, verbal persuasion, and physiological state. This instrument demonstrated good internal consistency, with a Cronbach's alpha coefficient of 0.81. The second tool is the Wayground Activity Logs, an automated log from bots recording the completion of mission levels, point values, and badges achieved, as objective evidence that humans are engaging in learning.

2.4. Data Analysis

The collected quantitative data were analysed using SPSS Statistics 26. The first step was the normality test to assess data distribution using the Kolmogorov-Smirnov and Shapiro-Wilk tests. According to these test results, if the data were normally distributed, a Paired-samples T-test would be applied; and if not ($p < .05$), the non-parametric Wilcoxon Signed-Rank Test will be used to test the statistical difference of the score changes. To prove the catalyst claim, the researcher calculated the Effect Size using Cohen's benchmarks. Sample size was calculated using power analysis with the G*Power program. Based on a paired t-test with alpha = 0.05 and beta = 0.80, the minimum sample size was estimated at 34 for a medium effect size ($d_z = 0.5$). With 36 students, the study had an adequate sample size to achieve statistical power and maintain a margin of error against potential data discrepancies or outliers that may arise during the research.

3. Results

The results present the research findings derived from the research data and hypotheses. The results and discussion section can be divided into several sub-sections.

3.1. Descriptive Statistic and Assumption Test

Before conducting the hypothesis test, descriptive analysis was performed to compare students' self-efficacy scores in the pre-test and post-test. The descriptive results from Table 1 indicate that students' mean self-efficacy score increased from 42.22 (pre-test) to 90.00 (post-test), suggesting a substantial improvement after using Wayground.

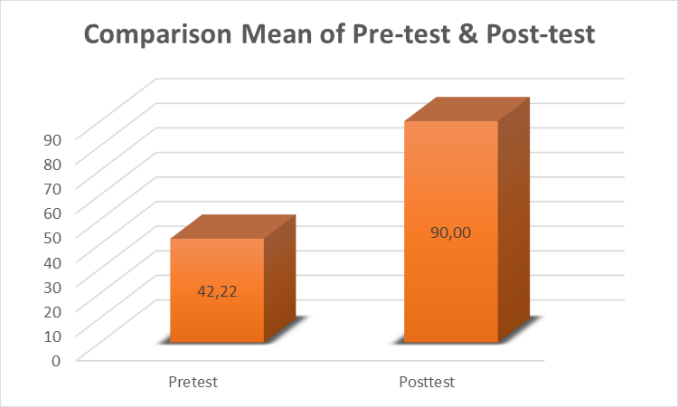

Figure 2. Pre-test mean vs. Post-test mean

Figure 2 clearly shows a significant increase in the post-test mean score relative to the pre-test mean score, indicating that Wayground GBL had a significant impact on students' self-efficacy.

Table 1. Descriptive Statistics of Students' Self-Efficacy

Variable	*N*	Minimum	Maximum	Mean	Std. Deviation
Pretest_Wayground_to_Self-Efficacy	36	20	70	42.22	11.979
Posttest_Wayground_to_Self-Efficacy	36	50	100	90.00	14.541

To ensure the validity of the statistical analysis, a normality test was performed on the difference scores (d) between the pre-test and post-test results. This procedure follows the recommendation to test the distribution of the change rather than the raw datasets separately. As shown in Table 2, the Shapiro-Wilk test yielded a significance value of .121 ($p > 0.05$), indicating that the gain scores are normally distributed. Consequently, the data met the assumption for parametric analysis. The normality test is shown in Table 2.

Table 2. Tests of Normality

Variable	Kolmogorov-Smirnov Statistic	*df*	*Sig.*	Shapiro-Wilk Statistic	*df*	*Sig.*
*d*_Score	.111	36	.200*	.952	36	.121

Based on the Shapiro-Wilk test, because the sample size was only 36 in Table 2, the *p*-value for *d*_score was 0.121 ($p > 0.05$). These results indicate that the gain scores are normally distributed, thus fulfilling the assumption for parametric statistical analysis. Next, a Paired-Sample T-test was used to determine whether there was a statistically significant difference in students' EFL self-efficacy before and after the intervention.

3.2. Hypothesis Testing

To examine whether there is a significant difference between the pre-test and post-test self-efficacy scores, the Paired-Sample T-test was used.

Table 3. Paired Sample T-test Results

		Paired Differences					t	df	Sig.
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pre-test – Post-test	-47.778	15.966	2.661	-53.180	-42.376	-17.955	35	.000

The results of the paired-samples t-test, shown in Table 3, indicate that students' self-efficacy scores in English as a foreign language (EFL) increased significantly after the intervention. The mean difference between the pre- and post-tests was -47.778, which indicates a substantial increase in confidence. Statistical analysis shows that $t(35) = -17.955$, $p < 0.001$. To measure the magnitude of this intervention, Cohen's d was calculated ($d = 2.99$), indicating a considerable effect size. These findings support the research hypothesis, confirming that implementing Wayground Digital Game-Based Learning has a statistically significant positive impact on the confidence of Indonesian vocational high school students in learning English.

The primary objective of this research was to examine whether Wayground-based game learning could enhance Indonesian vocational students' self-efficacy in learning English as a foreign language (EFL). The findings provide strong evidence that the intervention was effective, as indicated by both descriptive and inferential analyses.

The descriptive statistics indicated that students' self-efficacy had increased significantly. First, the pre-test mean score was 42.22, and the standard deviation (11.979), indicating that students generally had a low to moderate level of English confidence at the

beginning of learning. The post-test mean score increased significantly to 90.00, with a greater standard deviation (14.541), following the intervention. This rise is indicative of overall growth in self-efficacy and reflects increased differentiation in students' self-efficacy beliefs, with some benefiting more than others from the Wayground experience. Second, normality tests confirmed that the d_score data were normally distributed (Shapiro–Wilk = .952, p = .121). Based on this, a Paired-Samples T-test was used, which indicated a clear, statistically significant difference between pre-test and post-test scores (t(35) = -17.955). This finding is consistent with the conjecture that Wayground has a strong influence on self-efficacy.

Table 4. Wayground Activity Logs (Pre–Remedial vs. Final Attempt)

Score Range	Attempt 1 (n)	Attempt 1 (%)	Final attempt (n)	Final attempt (%)
≤ 50%	2	5.6%	0	0%
60%	3	8.3%	0	0%
70%	3	8.3%	0	0%
80%	8	22.2%	0	0%
90%	7	19.4%	0	0%
100%	13	36.1%	36	100%
Total	36	100%	36	100%

This activity log data is objective evidence rarely found in previous studies, which typically rely on questionnaires. According to Table 4 of the Wayground activity logs, there was a difference in results between the first and last trials. Only 13 of 36 (36.1%) students completed the examination successfully on the first attempt, with a score of 100%. The rest had gotten scores between 50% and 90%.

Students who achieved less than 80% were asked to attend reinforcement sessions and encouraged to retry the activity to ensure mastery of the content. Therefore, 100% of the 36 students obtained a final grade of 100% after the last attempt. These findings indicated that Wayground's game-based learning design was effective not only in promoting engagement but also in achieving the learning goal for every student. This objective mastery, as evidenced by the activity logs, likely contributed to the significant increase in students' self-efficacy scores, as successful performance experiences are a primary source of self-efficacy.

4. Discussion

From a pedagogical perspective, the significant increase in students' self-efficacy is not merely an effect of technology use but rather the result of creating a game-based environment, such as Wayground, that specifically addresses the psychological needs of vocational school students. These results confirm the motivational theory proposed by Jurado Enriquez et al. (2025). Additionally, this study makes a unique contribution by triangulating subjective psychological perceptions with objective behavioral evidence through digital activity logs (Kazu & Kuvvetli, 2023). The integration of this data shows that the surge in student self-efficacy is rooted in a real Mastery Experience, where the respawn and retry systems in the game turn linguistic failures under social pressure into technical opportunities that can be mastered without anxiety or fear (Alsswey & Malak, 2024; Y. Chen et al., 2022). Thus, Wayground acts as an instructional medium and a psychological laboratory that validates student competence through digitally measurable mission achievements.

The Wayground activity log data in Table 4 shows a significant jump from 36.1% of students mastering the material in the first experiment to 100% in the final experiment. This achievement is clear evidence of Mastery Experience, which is the strongest source of self-efficacy according to Bandura's theory (Bandura, 2006; Tecedor, 2024). This reality contrasts with traditional classrooms, where failure is often seen as the end. The respawn-

and-retry mechanism in the game has turned language errors into a series of micro-wins that motivate students to keep trying (Mauroner, 2019). For vocational high school students who are often stressed by rigid assessments, this approach is crucial; the platform has successfully rebranded English from a daunting academic subject into a practical technical tool, effectively lowering their mental barriers or affective filter (Liu et al., 2025; Patrick, 2019).

An interesting finding in this study is a shift in students' focus, from being burdened by abstract grammar theory to a greater emphasis on completing practical missions in pharmacy. By linking English directly to work procedures, vocational school students now view the language as a fundamental technical tool, rather than an academic burden irrelevant to their future (Purwati et al., 2023). This practical relevance psychologically reduces stress levels and improves students' physiological conditions. When English is seen as a professional necessity, their anxiety decreases, allowing self-efficacy to develop more naturally in a vocational environment (Teng, 2024).

In addition, the increase in post-test score variability (SD = 14.541) compared to the pre-test (SD = 11.979) indicates that all students improved, although at different rates. This difference indicates the presence of vicarious experience, in which students who see their peers complete missions in the game serve as motivators for others, a phenomenon that cannot be replicated through teacher-centered teaching (Eltahir et al., 2021; Pan et al., 2025).

In addition to these three factors, the element of Verbal Persuasion also appears through the instant feedback system on the Wayground platform. Unlike regular classes, where teachers often only provide corrections at the end of the lesson, this game system immediately responds to every student action, whether through appreciation during the process or instructions when they succeed or fail. Because this feedback is automatically and objectively provided (without judgment) by the system, it reassures students that they can correct their mistakes and complete tasks (Cabrera-Solano, 2022; Khaldi et al., 2023). The combination of rapid responses and a relaxed learning environment strengthens students' confidence in their abilities, ultimately leading to a significant increase in statistical scores in this study.

This study has significant pedagogical implications for the development of vocational education, particularly in the context of learning English as a foreign language (EFL). Theoretically, the success of this intervention demonstrates that self-efficacy is not merely a situational assessment but a psychological foundation that the right learning environment can shape. By integrating Bandura's four pillars of self-efficacy into the Wayground platform, mastery experiences, social modeling, verbal persuasion, and anxiety reduction, educators can transform rigid traditional instruction into a more student-centered learning experience.

Contextualizing English in technical procedures through digital simulations, for example, in pharmacy missions, shows that the relevance of language material to future professional needs is a key factor in motivating students in vocational education. In addition, the repetition system found in games encourages attitude change, where failure is no longer a definitive obstacle, but rather a learning process to master the material. Therefore, this study highlights the strategic integration of gamification mechanisms (game elements) into professional curricula to develop students' resilience and confidence in their professional communication skills.

Although the results are promising, this study has several limitations that should be considered in future research. First, the pre-experimental design with a single group and no control group weakens the ability to draw causal conclusions, as changes in perceived self-efficacy scores may be influenced by factors beyond the Wayground platform. Second, because this study was limited to 36 students from a specific major (Pharmaceutical Engineering) at SMK Negeri 1 Sampang, the results cannot be generalized to other vocational fields or to different majors such as business or mechanical engineering. The increase in standard deviation on the post-test indicates that learning speeds varied, which

explains why attributes such as basic digital literacy levels or individual learning style preferences were not considered in this study. Overall, the four-week intervention on which this study is based is only a snapshot of short-term effects, so further research is needed to assess whether this increase in self-confidence can be maintained in the long term.

5. Conclusion

This study investigated the impact of Wayground as a catalyst for enhancing students' self-efficacy in learning English within a vocational context. The findings provide strong empirical support within the study context that integrating Wayground into the curriculum significantly elevates students' confidence, motivation, and self-regulation. By converting procedural text lessons into immersive digital quests, the platform supported a clear shift from relatively low confidence at the start to a consistently high level of task competence within the game-based learning context, as evidenced by all activity records showing a 100% completion rate.

The findings suggest that students no longer view English as a daunting academic obstacle but as a teachable technical skill, further preparing them for real-world professional discourse in the field of pharmaceuticals. From an educational standpoint, the study strengthens the case for self-efficacy as a critical determinant of learning success, especially for vocational students, who are often thought to have a high affective filter. By engaging Bandura's four pillars of self-efficacy, particularly through iterative mastery and vicarious peer modelling, Wayground enables students to own their learning journey. It indicates that DGBL is not simply an amusement medium; rather, it is a psychological medium that nurtures a willingness for long-term language learning.

In summary, the evidence clearly positions Wayground as an accessible and relevant approach for teachers seeking to align technology knowledge with language confidence. These interactive tools need to be incorporated into Indonesian vocational education, where access to real English is severely limited, to change learners' beliefs and enhance their academic performance. Although individual variables such as digital literacy remain to be considered in future studies, the present study provides evidence that gamified contexts have a substantial effect on promoting a "can-do" attitude among the 21st-century global workforce.

Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Acknowledgment

The author extends her most profound appreciation to Dr. Yuliyanto Sabat, M.Pd., M.CE, and Dr. Laili Hibatin Wafiroh, S.S., M.Pd., M.CE, the lecturers at PGRI Delta University, who allowed her to learn and to complete this paper. It has been a valuable experience in her academic development, encouraging the growth of critical thinking skills and independent research.

References

Alogiliy, M. A. (2024). The Impact of Self-Efficacy on Academic Achievement Mediated by Learning Motivation and Moderated by Socioeconomic Status Among Jordanian EFL Students. Theory and Practice in Language Studies, 14(12), 3871–3879. https://doi.org/10.17507/tpls.1412.22

Alsswey, A., & Malak, M. Z. (2024). Effect of using gamification of “Kahoot!” as a learning method on stress symptoms, anxiety symptoms, self-efficacy, and academic achievement among university students. Learning and Motivation, 87, 101993. https://doi.org/10.1016/j.lmot.2024.101993

Anam, S., & Stracke, E. (2020). The role of self-efficacy beliefs in learning English as a foreign language among young Indonesians. TESOL Journal, 11(1). https://doi.org/10.1002/tesj.440

Bakan, U., Han, T., & Bakan, U. (2022). Learner perceptions and effectiveness of using a massively multiplayer online role-playing game to improve EFL communicative competence. Knowledge Management and E-Learning, 14(3), 286–303. https://doi.org/10.34105/j.kmel.2022.14.016

Bandura, A. (1997). Self Efficacy in Changing Societies. Cambridge University Press.

Bandura, A. (2006). Guide for constructing self-efficacy scales. Self-efficacy beliefs of adolescents.

Cabrera-Solano, P. (2022). Game-Based Learning in Higher Education: The Pedagogical Effect of Genially Games in English as a Foreign Language Instruction. International Journal of Educational Methodology, 8(4), 719–729. https://doi.org/10.12973/ijem.8.4.719

Chen, C.-A., Hsieh, C.-W., & Chen, D.-Y. (2021). Can Training Enhance Public Employees' Public Service Motivation? A Pretest–Posttest Design. Review of Public Personnel Administration, 41(1), 194–215. https://doi.org/10.1177/0734371X19872244

Chen, Y., Zhang, L., & Yin, H. (2022). A Longitudinal Study on Students ' Foreign Language Anxiety and Cognitive Load in Gamified Classes of Higher Education. Sustainability (Switzerland). https://doi.org/10.3390/su141710905

Chu, S., Hwang, G., Chien, S., & Chang, S. (2023). Incorporating teacher intelligence into digital games: An expert system-guided self-regulated learning approach to promoting <scp>EFL</scp> students' performance in digital gaming contexts. British Journal of Educational Technology, 54(2), 534–553. https://doi.org/10.1111/bjet.13260

Dahalan, F., Alias, N., & Shaharom, M. S. N. (2024). Gamification and Game Based Learning for Vocational Education and Training: A Systematic Literature Review. Education and Information Technologies, 29(2), 1279–1317. https://doi.org/10.1007/s10639-022-11548-w

Eltahir, M. E., Alsalhi, N. R., Al-Qatawneh, S., AlQudah, H. A., & Jaradat, M. (2021). The impact of game-based learning (GBL) on students' motivation, engagement and academic performance on an Arabic language grammar course in higher education. Education and Information Technologies, 26(3), 3251–3278. https://doi.org/10.1007/s10639-020-10396-w

Jia, W., Pack, A., Guan, Y., Zhang, L., & Zou, B. (2025). The influence of game-based learning media on academic English vocabulary learning in the EFL context. Computer Assisted Language Learning, 38(5–6), 1341–1365. https://doi.org/10.1080/09588221.2023.2276800

Jurado Enriquez, E. L., Tasayco Barrios, S., & Juarez de Tipacti, J. E. (2025). Google and Kahoot teaching resources for learning English in times of pandemic. Mextesol Journal, 49(2), 1–11. https://doi.org/10.61871/mj.v49n2-10

Kazu, İ. Y., & Kuvvetli, M. (2023). A triangulation method on the effectiveness of digital game-based language learning for vocabulary acquisition. Education and Information Technologies, 28(10), 13541–13567. https://doi.org/10.1007/s10639-023-11756-y

Khaldi, A., Bouzidi, R., & Nader, F. (2023). Gamification of e-learning in higher education: a systematic literature review. Smart Learning Environments, 10(1), 10. https://doi.org/10.1186/s40561-023-00227-z

Liu, X., Alotaibi, K. A., & Hashemifardnia, A. (2025). Serious Game-Based Learning: Its Impact on Happiness, Motivation, Self-Compassion, and Vocabulary Development in EFL Learners. European Journal of Education, 60(1). https://doi.org/10.1111/ejed.70030

Mantooth, R., Usher, E. L., & Love, A. M. A. (2021). Changing classrooms bring new questions: environmental influences, self-efficacy, and academic achievement. Learning Environments Research, 24(3), 519–535. https://doi.org/10.1007/s10984-020-09341-y

Mauroner, O. (2019). Gamification in Management and Other Non-Game Contexts—Understanding Game Elements, Motivation, Reward Systems, and User Types. Open Journal of Business and Management, 07(04), 1815–1830. https://doi.org/10.4236/ojbm.2019.74125

Menggo, S., Jama, K. B., Adnyani, N. L. P. S., & Krismayani, N. W. (2025). Indonesian English as a Foreign Language Learners' Interpersonal Communication: Profiles and Challenges. LLT Journal: A Journal on Language and Language Teaching, 28(1), 242–256. https://doi.org/10.24071/llt.v28i1.8670

Octaberlina, L. R., Muslimin, A. I., & Rofiki, I. (2022). An Investigation on the Speaking Constraints and Strategies Used by College Students Studying English as EFL Learners. International Journal of Learning, Teaching and Educational Research, 21(9), 232–249. https://doi.org/10.26803/ijlter.21.9.14

Pan, Y., Shao, X., & Shakibaei, G. (2025). Influence of digital game-based learning on social collaboration, problem-solving skills, and motivation: An integrative approach of expectancy-value theory and flow theory. Learning and Motivation, 90, 102123. https://doi.org/10.1016/j.lmot.2025.102123

Patrick, R. (2019). Comprehensible Input and Krashen's theory. Journal of Classics Teaching, 20(39), 37–44. https://doi.org/10.1017/S2058631019000060

Purwati, D., Ubaidillah, M. F., & Restall, G. C. (2023). "Sorry, I Can't Speak": English Teachers' Challenges of Teaching EFL Speaking in an Indonesian Vocational High School Sector. Mextesol Journal, 47(1), 1–9. https://doi.org/10.61871/mj.v47n1-1

Rayyan, M., Abusalim, N., Alshanmy, S., Abu Awwad, F. M., & Alghazo, S. (2024). Enhancing Academic Performance through Blended Learning: A Study on the Relationship between Self-Efficacy and Student Success. International Journal of Interactive Mobile Technologies (IJIM), 18(19), 52–67. https://doi.org/10.3991/ijim.v18i19.49835

Resnick, B. (2023). Theory of Self-Efficacy. In Middle Range Theory for Nursing. Springer Publishing Company. https://doi.org/10.1891/9780826139276.0010

Schunk, D. H., & DiBenedetto, M. K. (2021). Self-efficacy and human motivation (pp. 153–179). https://doi.org/10.1016/bs.adms.2020.10.001

Setyowati, R., Oktaviani, I., Hastuti, I., Nurnaningsih, N., Paki, R., & Jerniati, J. (2025). Gauging the Interactive Language Learning to improve English Communication Skills Among Vocational High School Students. World Journal of English Language, 15(4), 251. https://doi.org/10.5430/wjel.v15n4p251

Sirojuddin, M. Y. A. (2024). Integrating Heutagogy and Self-efficacy: Study on Bahtsul Masail-based Learning Design. Journal of Pesantren and Diniyah Studies, 2(1), 127. https://doi.org/10.54471/rjps.v2i1.1572

Stamenkov, G. (2023). Recommendations for improving research quality: relationships among constructs, verbs in hypotheses, theoretical perspectives, and triangulation. Quality & Quantity, 57(3), 2923–2946. https://doi.org/10.1007/s11135-022-01461-2

Tecedor, M. (2024). Digital Storytelling: Changing Learners' Attitudes and Self-efficacy Beliefs. Applied Linguistics, 45(1), 65–87. https://doi.org/10.1093/applin/amad002

Teng, M. F. (2024). Understanding Anxiety, Self-Efficacy, and Motivation in Online English Learning. Teaching English as a Second or Foreign Language--TESL-EJ, 27(4). https://doi.org/10.55593/ej.27108int

Teng, M. F., Wang, C., & Wu, J. G. (2023). Metacognitive Strategies, Language Learning Motivation, Self-Efficacy Belief, and English Achievement During Remote Learning: A Structural Equation Modelling Approach. RELC Journal, 54(3), 648–666. https://doi.org/10.1177/00336882211040268

Wulandari, B. A., Piscioneri, M., & Ikram, W. (2021). Examining Studentsâ€TM Challenges in Oracy in Academic Context Classes. International Journal of Language Education, 598–615. https://doi.org/10.26858/ijole.v5i1.16002

Yu, J., & Abdullah, R. (2025). Motivating Left-Behind Vocational Students in English Learning through Game-Based Listening Activities: The Interaction between Self-Esteem and

Listening Comprehension Skills. Forum for Linguistic Studies, 7(1). https://doi.org/10.30564/fls.v7i1.7509

Zhao, H. (2022). A Study on the Correlation Between Psychological Anxiety, Self-Efficacy, and Foreign Language Learning Achievement. International Journal of Neuropsychopharmacology, 25(Supplement_1), A63–A64. https://doi.org/10.1093/ijnp/pyac032.087

Zhuang, J. (2023). Boosting Self-motivation in English Language Learning: The Role of Learning Methods and Self-efficacy. Educational Administration: Theory and Practice, 29(3), 318–339. https://doi.org/10.52152/kuey.v29i3.749