

STUDENTS' PERCEPTIONS OF WAYGROUND AI IN GAME-BASED LEARNING FOR ENHANCING ENGLISH VOCABULARY AT MAN PURWOREJO

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Abstract

The game-based learning tools have been widely used in educational settings. Limited research has examined students' perceptions of AI-powered game-based learning platforms. This study aimed to investigate students' perceptions of the use of Wayground AI in game-based learning for enhancing English vocabulary at MAN Purworejo, an Islamic senior high school in Indonesia. A descriptive quantitative survey design was employed involving 25 students selected through purposive sampling, after which data were collected using a 20-item questionnaire based on the Technology Acceptance Model (TAM), covering perceived ease of use, perceived usefulness, attitude toward use, behavioral intention, and learning engagement. The data were analyzed using descriptive statistics, particularly mean scores. The findings revealed generally neutral-to-positive perceptions toward the use of Wayground AI. Among the five constructs, only attitude toward use showed a positive perception ($M = 3.51$), indicating that students generally enjoyed learning with the platform. Meanwhile, perceived ease of use ($M = 3.39$), perceived usefulness ($M = 3.18$), behavioral intention ($M = 2.90$), and learning engagement ($M = 3.29$) remained within the neutral category. Item-level analysis showed relatively higher ratings for enjoyment and interest in learning activities, whereas vocabulary retention and intentions for regular future use received lower scores. These findings suggest that Wayground AI can contribute to positive learning experiences and classroom participation. However, its perceived effectiveness for long-term vocabulary retention and sustained independent use remains limited. The study highlights the importance of integrating AI-supported game-based learning with consistent instructional support and follow-up activities to maximize its educational potential.

Keywords: Students' Perception, Wayground AI, Game-Based Learning, Vocabulary, Technology Acceptance Model

INTRODUCTION

Vocabulary mastery plays a crucial role in achieving effective communication in English, both orally and in written form. Vocabulary knowledge influences learners' ability to understand spoken and written language, as well as express ideas effectively (Richards et al., 2002). In addition, vocabulary is considered a fundamental component affecting the development of all four language skills: listening, speaking, reading, and writing (Stæhr, 2008). Despite its importance, many EFL learners continue to experience difficulties in retaining and using vocabulary productively. Vocabulary learning requires repeated exposure, contextualized practice, and meaningful use over time rather than simple memorization alone (Schmitt, 2008). As a result, vocabulary retention remains a persistent challenge in many EFL learning contexts.

Despite the importance of vocabulary learning, instruction in secondary-level English classrooms is still dominated by conventional methods such as memorization, translation, and textbook-based exercises. These teacher-centered approaches often create less interactive learning environments, which may reduce students' motivation, participation, and engagement in vocabulary learning. Previous studies indicate that interactive and strategy-based instruction can improve students' vocabulary achievement and participation in learning activities (Ayana et al., 2024). Similarly, the use of appropriate instructional media can support vocabulary learning and improve students' understanding of new words (Anggraeni et al., 2021). However, vocabulary retention remains problematic because students frequently forget newly learned words when opportunities for repeated and meaningful use are limited.

To address these challenges, game-based learning (GBL) has emerged as an alternative instructional approach that promotes interactive and enjoyable learning experiences. GBL integrates elements such as challenges, rewards, competition, and immediate feedback that may help increase students' motivation and engagement. Digital game-based learning has been reported to create immersive learning environments that can support vocabulary acquisition and retention when implemented appropriately (Vnucko & Klimova, 2023). Furthermore, students often perceive game-based learning as a more enjoyable learning approach than traditional methods, although its effectiveness may depend on instructional design and learning objectives (Ismail et al., 2025). Interactive learning activities may also contribute to the development of productive language skills such as speaking and writing (Fadhila et al., 2025).

However, game-based learning also presents several challenges. An excessive emphasis on entertainment, competition, and rewards may divert students' attention from the intended learning objectives and encourage superficial learning rather than deeper understanding. In some cases, students may focus more on achieving high scores than on mastering vocabulary content. Therefore, the effectiveness of game-based learning depends not only on the game elements themselves but also on appropriate instructional design and teacher guidance.

Alongside the development of game-based learning, Artificial Intelligence (AI) has increasingly been integrated into language instruction. AI-supported learning technologies can provide adaptive learning systems, personalized exercises, and immediate feedback that may support students' individual learning needs (Liu et al., 2024). AI-based systems are capable of adjusting vocabulary difficulty levels and offering relevant practice activities, which may

contribute to improved vocabulary learning outcomes. Moreover, exposure to authentic language input and interactive learning activities can support the development of students' linguistic competence (Aulia et al., 2024). Despite these advantages, the implementation of AI in education still requires proper guidance because students differ in their digital literacy and ability to use technological tools effectively.

One platform that combines AI features with game-based learning is Wayground. The platform provides interactive quizzes, adaptive learning features, immediate feedback, and opportunities for repeated practice, which are important components of vocabulary learning. These features may support students in reviewing vocabulary items, receiving corrective feedback, and maintaining engagement during learning activities. Previous studies have shown that digital learning platforms can function not only as assessment tools but also as instructional media that support students' focus and participation in language learning (Nirwasita & Astuti, 2021). Interactive multimedia activities have also been associated with increased engagement in English learning (Shafira et al., 2025). Therefore, Wayground represents a relevant platform for investigating students' perceptions of AI-supported game-based learning in vocabulary instruction.

To understand students' acceptance of educational technology, many researchers apply the Technology Acceptance Model (TAM). TAM explains that users' acceptance of technology is primarily influenced by perceived usefulness and perceived ease of use. When students perceive a learning platform as useful and easy to operate, they are more likely to develop positive attitudes and intentions toward using it (Davis, 1989). In language learning contexts, TAM has frequently been used to investigate students' acceptance of digital learning platforms, mobile-assisted language learning applications, and AI-supported educational technologies. Previous studies reported that perceived usefulness and perceived ease of use positively influence students' motivation and engagement in technology-assisted language learning environment. However, positive perceptions do not always guarantee students' long-term intention to continue using educational technology independently.

Several previous studies have investigated the effectiveness of game-based learning and AI-assisted platforms in English learning. Most studies reported positive findings regarding students' engagement, motivation, and classroom participation. However, research focusing specifically on students' perceptions of AI-supported game-based learning platforms for vocabulary learning remains limited, particularly in Indonesian Islamic senior high school contexts. Existing studies mostly focus on general secondary schools or university students, while studies conducted in Madrasah Aliyah settings are still scarce. In addition, limited studies have examined students' perceptions based on TAM constructs such as perceived usefulness, perceived ease of use, behavioral intention, attitude toward use, and learning engagement simultaneously.

Based on these gaps, this study aims to investigate students' perceptions of using Wayground in game-based learning for enhancing English vocabulary at MAN Purworejo. The study specifically focuses on students' perceptions regarding perceived ease of use, perceived usefulness, attitude toward use, behavioral intention, and learning engagement toward the platform.

This research focuses on five core areas regarding the use of Wayground in English vocabulary learning. Specifically, it examines how students perceive the platform's ease of use and its overall usefulness in enhancing their vocabulary acquisition. Furthermore, the study explores students' attitudes toward this game-based learning approach, how the platform influences their classroom engagement, and their behavioral intentions regarding the future use of Wayground for vocabulary development.

METHOD

This study employed a quantitative descriptive research design using a survey approach to investigate students' perceptions of the use of Wayground in game-based learning for enhancing English vocabulary. A quantitative approach was considered appropriate because the study focused on collecting numerical data and describing patterns of students' perceptions statistically (Creswell, 2009). A survey approach utilizing a structured questionnaire allowed for efficient, systematic data collection (Fraenkel et al., 2011). The objective of this study was to explore students' perceptions rather than to test causal relationships or generalize findings to a wider population, descriptive quantitative analysis was considered suitable for the research purpose.

The research was conducted at MAN Purworejo, an Islamic senior high school located in Purworejo, Central Java, Indonesia. MAN Purworejo was selected as the research site because the school has begun integrating digital technologies into English language instruction, including the use of AI-supported learning platforms such as Wayground. This context provides a relevant setting for examining students' perceptions of AI-supported game-based learning, particularly in vocabulary instruction within an Indonesian Islamic senior high school environment. Furthermore, limited studies have investigated the implementation of AI-assisted vocabulary learning in Madrasah Aliyah settings, making this context valuable for further exploration.

The participants consisted of 25 Grade XI students from MAN Purworejo, comprising 11 male and 14 female students. Purposive sampling was employed because the participants were intentionally selected based on criteria relevant to the study objectives, namely students who had direct experience using Wayground AI in English vocabulary learning activities. The inclusion criteria required participants to have participated in classroom vocabulary learning activities using Wayground and to have sufficient experience interacting with the platform during instruction. Students who had not used Wayground or were absent during the implementation period were excluded from the study. All eligible students in the selected class participated voluntarily, and no students declined participation. The sample was limited to one class to obtain focused and context-specific data regarding students' perceptions within the MAN learning environment. Although the sample size was relatively small, it was considered adequate for descriptive research aimed at identifying response tendencies and perception patterns rather than producing broad statistical generalizations. In addition, demographic information regarding gender, prior experience with digital learning tools, and familiarity with online learning platforms was collected to provide contextual background for the study. Most participants reported previous experience using digital learning applications for educational

purposes, indicating a basic level of familiarity with technology-supported learning environments.

During the implementation process, Wayground was integrated into English vocabulary learning activities for approximately four meetings over a two-week period. The platform was used to deliver vocabulary exercises related to descriptive texts, daily activities, and classroom expressions. Students participated in interactive quiz-based activities individually and in groups. Features such as gamified challenges, immediate feedback, scoreboards, and repetition exercises were utilized to encourage students' participation and engagement during learning activities.

The primary data source of this study was students' responses to a perception questionnaire developed based on the Technology Acceptance Model (TAM). According to Davis, (1989), TAM explains that users' acceptance of technology is influenced mainly by perceived usefulness and perceived ease of use. The questionnaire measured five constructs: perceived usefulness, perceived ease of use, attitude toward use, behavioral intention, and learning engagement. The TAM constructs were adapted from (Davis, 1989) and (Davis et al., 1989), while the learning engagement construct was derived from theories of game-based learning and student engagement proposed by (Blumenfeld & Paris, 2004; Gee, 2003; Prensky, 2001).

Data were collected using a 20-item questionnaire adapted from previous studies on the Technology Acceptance Model (TAM) and modified to suit the context of AI-supported game-based vocabulary learning. The questionnaire measured five constructs: perceived ease of use, perceived usefulness, attitude toward use, behavioral intention, and learning engagement. Responses were recorded using a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). Prior to data collection, the instrument was reviewed by experts in English language education to ensure content validity, clarity, and relevance to the study objectives. Revisions were made based on the experts' feedback. Reliability testing was conducted using Cronbach's Alpha, and the instrument obtained a reliability coefficient of 0.84, indicating good internal consistency and acceptable reliability for research purposes.

Table 1. Likert Scale Used in the Questionnaire

Scale	Interpretation
1	Strongly Disagree
2	Disagree
3	Neutral
4	Agree
5	Strongly Agree

Data collection was conducted after students completed the vocabulary learning activities using Wayground. The questionnaire was distributed online through Google Forms to facilitate efficient data collection and allow students to respond independently based on their actual learning experiences. Students were given sufficient time to complete the questionnaire without external intervention to minimize response bias. Mean scores were interpreted using predetermined score intervals established before data analysis. Because

some mean scores were close to category boundaries, the findings were interpreted cautiously to avoid overstating the strength of students' perceptions. Therefore, the score categories were used as descriptive guidelines rather than absolute indicators of students' perceptions, allowing for a more balanced interpretation of the results.

The collected data were analyzed using descriptive statistical techniques, including the calculation of mean scores and percentages to describe students' perceptions of using Wayground AI in vocabulary learning. Mean scores were interpreted using predetermined score intervals that had been established prior to data analysis. The score intervals were adapted from (Alkharusi, 2022) and were used as descriptive guidelines for interpreting students' responses. Some mean values were close to category boundaries, the findings were interpreted cautiously to avoid overstating the strength of students' perceptions. Therefore, the reported categories should be understood as general indicators of perception tendencies rather than absolute measures of acceptance or rejection.

Table 2. Categorization of Students' Perceptions

Score Interval	Category
4.20 – 5.00	Very Positive
3.40 – 4.19	Positive
2.60 – 3.39	Neutral
1.80 – 2.59	Negative
1.00 – 1.79	Very Negative

Ethical considerations were taken into account throughout the study. Before the questionnaire was administered, students were informed about the purpose of the research and that their participation was voluntary. They were assured that their responses would be kept confidential and used only for research purposes. To protect participants' privacy, no personal identifying information was included in the data analysis or reporting of the findings.

RESULTS AND DISCUSSION

The results are presented descriptively to illustrate students' perceptions of using Wayground AI in vocabulary learning. The findings are organized into three levels of analysis: construct-level results, item-level results, and frequency distribution patterns. Because the study employed descriptive statistics, the findings should be interpreted as general tendencies rather than evidence of causal relationships or statistical effects. The overall results based on TAM constructs are presented in Table 3.

Table 3. Mean Scores by TAM Constructs

Variable	Mean	SD	Category
Perceived Ease of Use	3.39	0.64	Neutral
Perceived Usefulness	3.18	0.59	Neutral
Attitude Toward Use	3.51	0.67	Positive
Behavioral Intention	2.90	0.71	Neutral
Learning Engagement	3.29	0.61	Neutral

As shown in Table 3, students demonstrated generally neutral-to-positive perceptions toward the use of Wayground in vocabulary learning activities. The highest mean score was found in attitude toward use ($M = 3.51$), indicating that students tended to enjoy and respond positively to the learning experience provided by the platform. Meanwhile, perceived ease of use ($M = 3.39$), perceived usefulness ($M = 3.18$), behavioral intention ($M = 2.90$), and learning engagement ($M = 3.29$) fell within the neutral category, suggesting that students' perceptions toward these aspects were moderate rather than strongly favorable.

The mean score for perceived ease of use ($M = 3.39$) suggests that students were generally able to operate the platform without major technical difficulties. However, because the score remained within the neutral category and was close to the upper category boundary, it should be interpreted as indicating moderate accessibility rather than full acceptance of the platform. Similarly, perceived usefulness ($M = 3.18$) also remained within the neutral category, suggesting that students recognized some benefits of Wayground for vocabulary learning, although these benefits were not strongly perceived by all participants. Therefore, both constructs reflect moderate perceptions rather than strong endorsement of the platform's ease of use or usefulness.

Interestingly, attitude toward use ($M = 3.51$) obtained the highest mean score among all constructs and was categorized as positive. This finding reflects students' favorable emotional responses toward the application. Students tended to enjoy learning activities using Wayground more than conventional vocabulary instruction. This result is consistent with previous studies indicating that game-based learning environments can increase students' motivation and participation in language learning activities (Azzahra & Kembaren, 2025). The gamified elements, such as competition, scoring systems, and immediate feedback, likely contributed to students' positive attitudes toward the learning process. Behavioral intention ($M = 2.90$) fell within the neutral category, indicating that students showed uncertainty regarding their intention to continue using the platform independently in the future. Although students generally enjoyed using the application during classroom activities, this positive experience did not automatically translate into a strong intention for long-term independent use. This finding suggests that students may still rely on teacher guidance and structured classroom implementation when using digital learning tools. An important finding is the gap between students' positive attitude toward Wayground and their relatively neutral behavioral intention to continue using it. Although students reported enjoying the platform and expressed positive feelings toward the learning experience, these perceptions did not translate into a strong intention to use the application independently outside classroom activities. This finding suggests that enjoyment alone may not be sufficient to encourage sustained use of educational technology. Factors such as teacher support, learning objectives, perceived long-term benefits, and opportunities for independent practice may also influence students' willingness to continue using the platform.

Learning engagement ($M = 3.29$) also fell within the neutral category, indicating moderate student participation during learning activities. Students appeared actively involved in quiz-based tasks and classroom interaction; however, the level of engagement was not consistently high for all participants. Differences in learning preferences, motivation, and

familiarity with digital platforms may have influenced students' engagement levels. To provide more detailed findings, the mean scores of each questionnaire item are presented in Table 4.

Table 4. Mean Scores of Each Questionnaire Item

No	Statement	Mean	Category
1	Wayground is easy to use	3.64	Positive
2	I can use Wayground smoothly	3.32	Neutral
3	Instructions are clear	3.56	Positive
4	Easy to learn how to use	3.04	Neutral
5	Helps learn vocabulary effectively	3.40	Positive
6	Improves vocabulary mastery	3.16	Neutral
7	Helps remember vocabulary	2.80	Neutral
8	Makes learning efficient	3.36	Neutral
9	I enjoy learning with Wayground	3.44	Positive
10	More interesting than traditional methods	3.76	Positive
11	Increases learning interest	3.36	Neutral
12	I have a positive attitude toward it	3.48	Positive
13	I intend to continue using it	2.56	Negative
14	I plan to use it regularly	2.56	Negative
15	I would recommend it to others	3.32	Neutral
16	I prefer it over conventional methods	3.16	Neutral
17	Makes me actively involved	3.20	Neutral
18	Encourages participation	3.32	Neutral
19	Interactive features help memory	3.24	Neutral
20	Encourages learning effort	3.40	Positive

Based on Table 4, students generally perceived the platform as easy to use. Items related to interface clarity and ease of operation received positive scores, indicating that students did not experience major technical barriers while using the application. Nevertheless, the relatively moderate score for learning how to use the platform suggests that some students still required initial guidance and adaptation. In terms of usefulness, students acknowledged that Wayground supported vocabulary learning activities and made learning more efficient. However, one notable finding is Item 7 ("Helps remember vocabulary"), which obtained a mean score of 2.80 and remained within the neutral category. This result suggests that although students enjoyed the learning activities, they were uncertain about the platform's effectiveness in supporting long-term vocabulary retention. The finding indicates that game-based activities may promote short-term engagement and vocabulary recognition; however, they do not necessarily lead to deeper vocabulary mastery. Long-term vocabulary development requires repeated exposure, contextualized use, and opportunities to apply words in meaningful communication. Therefore, game-based quizzes may be beneficial as a practice tool, but they may not be sufficient on their own to support durable vocabulary retention and productive vocabulary use.

Students' attitudes toward the application were generally positive. They considered the learning process more interesting and enjoyable compared to traditional classroom methods. Item 10 ("More interesting than traditional methods") obtained the highest score (M = 3.76), showing that students preferred interactive learning activities over conventional approaches such as memorization and textbook exercises. This supports the argument that game-based learning environments can create more engaging and less monotonous classroom experiences. However, behavioral intention items showed less favorable results. Items 13 and 14 obtained mean scores of 2.56 and were categorized as negative. These findings indicate that students were uncertain and less motivated to continue using the platform regularly outside classroom activities. Although they enjoyed using Wayground during lessons, they may have perceived the application mainly as a classroom support tool rather than a platform for independent learning.

Learning engagement items demonstrated moderate student participation during the activities. Students responded to questions, followed instructions, and participated actively in quizzes. However, the engagement levels were not consistently strong across all participants, suggesting that engagement may also depend on task design, classroom management, and students' individual learning preferences. To further illustrate students' response patterns, Table 5 presents the frequency distribution of questionnaire responses.

Table 5. Frequency Distribution of Students' Responses

Scale	Category	Frequency	Percentage
5	Strongly Agree	18	3.6%
4	Agree	149	29.8%
3	Neutral	231	46.2%
2	Disagree	87	17.4%
1	Strongly Disagree	15	3.0%
	Total	500	100%

As shown in Table 5, the largest proportion of responses fell within the neutral category. This indicates that many students did not hold strongly positive or strongly negative perceptions regarding the use of Wayground in vocabulary learning. Instead, students tended to show moderate or uncertain responses toward several aspects of the platform. The second-largest proportion of responses was found in the agree category, indicating that a considerable number of students perceived the platform positively, particularly in terms of enjoyment, ease of use, and classroom interaction. These responses suggest that interactive and gamified learning environments may contribute to positive learning experiences. However, the findings should be interpreted cautiously because most responses remained within the neutral category, indicating moderate rather than strongly favorable perceptions.

Nevertheless, the presence of disagree responses also deserves attention. These responses may reflect students' concerns regarding the effectiveness of the platform for vocabulary retention and independent learning. In particular, the relatively low scores related to behavioral intention suggest that students may still depend on teacher guidance and structured classroom implementation when using digital learning platforms. The relatively

small percentage of strongly agree responses further indicates that the platform has not yet produced a strong impact on all participants. This finding suggests that while Wayground may support classroom engagement and motivation, learning engagement remained within the neutral category. Therefore, engagement should be interpreted as moderate and may depend on instructional design, classroom implementation, and the extent to which the platform is integrated into meaningful learning activities.

The findings of this study indicate generally neutral-to-positive perceptions toward the use of Wayground in vocabulary learning. From the perspective of the Technology Acceptance Model (TAM), perceived ease of use and perceived usefulness are considered important factors influencing users' acceptance of technology (Davis, 1989). In this study, both constructs remained within the neutral category. The perceived ease of use score ($M = 3.39$) was close to the upper boundary of the neutral category, suggesting that students generally found the platform accessible and manageable. However, this result should be interpreted as moderate accessibility rather than full acceptance. Similarly, perceived usefulness ($M = 3.18$) indicates that students recognized some benefits of the platform, although these benefits were not strongly perceived by all participants.

The positive result in attitude toward use demonstrates that students emotionally responded well to the gamified learning environment. Features such as competition, scoring systems, and instant feedback may have contributed to students' interest and classroom participation. However, learning engagement remained within the neutral category, indicating a moderate level of engagement rather than a strong effect. This suggests that engagement may depend not only on the platform itself but also on instructional design, classroom implementation, and students' individual learning preferences. This finding is consistent with previous studies suggesting that game-based learning environments can improve students' engagement and motivation in language learning activities (Azzahra & Kembaren, 2025). However, the findings also reveal important limitations. Behavioral intention remained relatively moderate, and vocabulary retention did not receive strong responses from students. These results indicate that positive classroom experiences alone may not be sufficient to encourage sustained technology use or deeper vocabulary acquisition. Students may still require teacher guidance, contextual learning activities, and repeated vocabulary practice to achieve long-term retention.

The findings also support previous research arguing that game-based learning is effective in promoting engagement but does not automatically guarantee deeper learning outcomes (Prastiwi & Lestari, 2025). Consequently, vocabulary learning activities should be supported by follow-up instructional strategies such as speaking tasks, writing exercises, and contextual language practice. These findings suggest that Wayground is most effective when integrated with broader instructional practices rather than used as a standalone learning tool.

Despite these contributions, this study has several limitations. First, the findings are based on descriptive analysis and therefore cannot be used to infer causal relationships among TAM constructs. Second, the study involved a relatively small sample of 25 students from a single class, which limits the generalizability of the findings. Consequently, the results should be interpreted as context-specific perceptions rather than representative of broader student populations. Future studies

may employ inferential statistical techniques such as correlation or regression analysis to examine relationships among perceived usefulness, perceived ease of use, attitude toward use, and behavioral intention. Larger sample sizes and broader research settings may also provide more comprehensive findings regarding the implementation of AI-supported game-based learning in English vocabulary instruction.

CONCLUSION

The findings revealed generally neutral-to-positive perceptions toward the platform. Among the five TAM constructs, only attitude toward use was categorized as positive, indicating that students generally enjoyed learning with Wayground. Meanwhile, perceived ease of use, perceived usefulness, behavioral intention, and learning engagement remained within the neutral category. The results also showed that although students appreciated the learning experience provided by the platform, its perceived contribution to long-term vocabulary retention and continued independent use was limited.

These findings suggest that Wayground can support enjoyable and interactive vocabulary learning experiences; however, the platform alone may not be sufficient to promote sustained vocabulary retention or independent learning behavior. Therefore, Wayground should be viewed as a complementary instructional tool that is most effective when combined with teacher guidance, contextualized learning activities, and consistent opportunities for vocabulary practice. The findings also highlight the importance of instructional design in maximizing the educational value of AI-supported game-based learning.

Future research is recommended to examine factors influencing students' continued use of AI-supported learning platforms, including teacher support, learning frequency, and instructional design. Studies involving larger samples and diverse educational contexts may provide more comprehensive evidence regarding students' acceptance of AI-supported game-based learning and its role in vocabulary development.

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