



Usability and user experience evaluation of Wayground for self-regulated learning

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ABSTRACT

The increasing use of digital learning applications in Indonesian high schools raises questions about whether these applications truly support students' independence in learning. This study aims to evaluate the usability and user experience of the Wayground application among high school students, and to examine the relationship between usability and user experience and their self-regulated learning. This evaluation is important because previous studies generally evaluate usability and user experience separately, leaving little research on their role together in supporting learning independence. This study is descriptive and evaluative, using a quantitative approach; data were collected from 55 active Wayground users at Al-Muhajirin Fullday High School via a questionnaire that combined the System Usability Scale and the HEART Framework, covering happiness, engagement, adoption, retention, and task success. The results showed a marginally low SUS score, a D grade, and 12.18 points below the industry average. The user experience score was considered good but at the lower end, with engagement and task success the lowest. This pattern indicates that usability constraints have the greatest impact on self-regulated use, potentially hindering students' independence in learning. This study recommends incremental improvements to Wayground's navigation, system feedback, gamification, and onboarding process.

ARTICLE INFO

Article History:

Received: 16 Apr 2026

Revised: 27 Aug 2026

Accepted: 2 Sep 2026

Publish online: 20 Sep 2026

Keywords:

HEART framework; self-regulated learning; system usability scale; user experience

Open access

Curricula: Journal of Curriculum Development is a peer-reviewed open-access journal.

ABSTRAK

Meningkatnya penggunaan aplikasi pembelajaran digital di sekolah menengah atas di Indonesia memunculkan pertanyaan tentang apakah aplikasi tersebut benar-benar mendukung kemandirian belajar murid. Penelitian ini bertujuan untuk mengevaluasi usability dan menganalisis user experience aplikasi Wayground pada murid SMA, serta mengkaji keterkaitan keduanya dengan self-regulated learning murid. Evaluasi ini penting dilakukan karena kajian terdahulu umumnya mengevaluasi usability dan user experience secara terpisah, sehingga peran keduanya secara bersama-sama dalam mendukung kemandirian belajar belum banyak dikaji. Penelitian ini bersifat deskriptif evaluatif dengan pendekatan kuantitatif; data dikumpulkan dari 55 murid pengguna aktif Wayground di SMA Fullday Al-Muhajirin melalui kuesioner yang menggabungkan System Usability Scale dan HEART Framework, meliputi happiness, engagement, adoption, retention, dan task success. Hasil menunjukkan skor SUS termasuk kategori marginal low dengan grade D, yang berada 12,18 poin di bawah ambang rata-rata industri. Skor user experience tergolong baik, namun berada pada batas bawah, dengan engagement dan task success sebagai capaian terendah. Pola tersebut menunjukkan bahwa kendala usability paling memengaruhi penggunaan mandiri, yang berpotensi menghambat kemandirian belajar murid. Penelitian ini merekomendasikan perbaikan bertahap pada navigasi, umpan balik sistem, gamifikasi, serta proses onboarding Wayground.

Kata Kunci: kerangka HEART; pengalaman pengguna; self-regulated learning; system usability scale

How to cite (APA 7)

Oktaviani, N. E., & Widodo, S. (2026). Usability and user experience evaluation of Wayground for self-regulated learning. *Curricula: Journal of Curriculum Development*, 5(3), 1179-1192.

Peer review

This article has been peer-reviewed through the journal's standard double-blind peer review, where both the reviewers and authors are anonymised during review.

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INTRODUCTION

The rapid advancement of information and communication technology has prompted a paradigm shift in education, moving from a teacher-centered approach to a learner-centered one. This shift has been reinforced in Indonesia through policies such as Merdeka Belajar and Kurikulum Merdeka, which emphasize flexible and contextual learning that allows students to study according to their own pace, needs, and abilities, and it has made digital learning media an increasingly important means of supporting independent study (Zainun & Arifin, 2024). As digital learning media take on a larger role in everyday instruction, the quality of the applications themselves, not merely their availability, becomes central to whether this policy direction is actually realized in practice (Yadav, 2024).

Even so, the success of digital learning media does not depend solely on the availability of technology or the completeness of an application's features (Harianto et al., 2024). In practice, several learning applications have not been able to provide an optimal user experience because their interfaces are not intuitive, their navigation is confusing, or their pages load slowly, so that students end up spending more attention on operating the application than on understanding the material, a concern closely related to the usability principles later discussed in the Literature Review (Harianto et al., 2024). In addition, the use of learning applications often still depends heavily on teacher instruction. In contrast, independent use outside classroom activities remains relatively low, even though one of the main goals of integrating technology into education is to foster self-regulated learning among students (Palalas & Wark, 2020).

As later sections of this article will show, this tension between teacher-dependent and independent use is one of the clearest patterns in this study's findings. One application that has increasingly been adopted in classroom settings is Wayground, a digital learning platform that provides features for delivering materials, interactive quizzes, practice exercises, evaluation, and monitoring of learning outcomes; the platform was formerly known as Quizizz before being rebranded as Wayground in 2025 (Azizah et al., 2025). Based on preliminary observations at SMA Fullday Al-Muhajirin, the Wayground application has been used routinely, particularly for quizzes and evaluations. However, most students access it only when instructed by their teacher. Several students reported difficulties, such as trouble locating certain menus and slow page loading.

This condition indicates the need for a more comprehensive evaluation of how the Wayground application is actually experienced by its student users, an evaluation that, as explained below, requires attention to both usability and the broader user experience rather than either aspect on its own (Abdulrahman & Rawf, 2022; Paul et al., 2022). Studies evaluating digital learning applications have generally examined usability and user experience separately rather than in an integrated manner. For instance, one study evaluated the usability of a university library website using the System Usability Scale without extending the analysis to broader dimensions of user experience (Nuriman & Mayesti, 2020). Another study analyzed the user experience of a digital library application using the HEART metrics framework, without assessing usability with a standardized instrument such as the System Usability Scale (Fa'iqoh & Suyatno, 2024).

A further study likewise focused solely on usability when evaluating an information system, leaving open the question of how users actually felt about the system beyond its ease of operation (Haerani et al., 2025). This separation points to a research gap concerning the integrated evaluation of usability and user experience within a single study, particularly one that also relates the findings to the construct of self-regulated learning among senior high school students. Combining these two instruments is scientifically significant because each captures a dimension the other cannot: the System Usability Scale can indicate that an application is difficult to operate, yet it cannot reveal whether users still find the application enjoyable, visually appealing, or worth returning to, aspects that fall outside its operational focus; conversely, the HEART framework can capture favorable happiness or retention scores even when an application is technically difficult to use, since these dimensions are shaped more by subjective attitude than by operational performance, but it does not, on its own, provide a standardized benchmark against which usability can be judged.

Used separately, then, either instrument risks producing an incomplete or even misleading picture; for example, a favorable HEART score alone might mask underlying usability barriers, while a low System Usability Scale score alone would not explain why students continue to express willingness to use the application. The present study addresses this gap directly by applying both instruments to the same respondents, and the Discussion section returns explicitly to how the resulting divergence between the two, particularly the gap between a low usability score and a comparatively favorable happiness score, complements what a single instrument alone could not have revealed. Building on this gap, the present study offers a novel contribution by evaluating usability through the System Usability Scale and user experience through the HEART framework at the same time on the Wayground application, and by descriptively relating the pattern of results from both instruments to their potential role in supporting the optimization of self-regulated learning among senior high school students. This angle has not been widely addressed in previous research (Hidayat et al., 2020).

Based on this background, the present study addresses how the usability of the Wayground application can be described using the System Usability Scale, how its user experience can be analyzed through the HEART framework across the dimensions of happiness, engagement, adoption, retention, and task success, how the results of the usability evaluation relate descriptively to the user experience findings, how usability and user experience together may relate to the self-regulated learning of senior high school students, and what improvement recommendations can be formulated from the evaluation results. Because this study is descriptive and evaluative in nature and is not intended to test inferential relationships between variables, no statistical hypothesis is proposed; instead, the relationship among the measurement results is described based on the pattern of the scores obtained. In line with these questions, this study aims to evaluate the usability of the Wayground application using the System Usability Scale, analyze its user experience using the HEART framework, and identify aspects requiring improvement based on the results of both instruments.

LITERATURE REVIEW

Digital learning media enable the integrated presentation of text, images, audio, video, and animation, and facilitate two-way interaction between students and learning content through

features such as practice exercises, interactive quizzes, automated feedback, and gamification (Tarigan et al., 2023). One competency that is expected to grow through the use of such media is self-regulated learning (Findyartini et al., 2024; Wijayati et al., 2022). Self-regulated learning can be defined as an individual's capacity to set learning goals, choose appropriate strategies, monitor their learning progress, and evaluate the outcomes achieved (Perels & Dörrenbächer, 2020). Consistent with this theoretical view, empirical evidence among Indonesian students shows that self-regulated learning is closely associated with the ability to manage study time, sustain motivation, and take initiative in completing learning tasks without constant external supervision (Apriyanto et al., 2025; Hidayat et al., 2020; Hutajulu, 2025).

In technology-based learning, the capacity for independent learning is strongly shaped by the quality of the learning media used (Errabo et al., 2024; Nunirmala et al., 2024). An application that is easy to understand and operate allows students to focus on the learning content. In contrast, a difficult-to-use application consumes students' cognitive resources on solving technical problems, thereby reducing the effectiveness of the learning process (Faudzi et al., 2023). Accordingly, the quality of a learning application has a close bearing on how well students can develop their self-regulated learning (Anuar et al., 2023).

Usability and the System Usability Scale

Usability refers to the extent to which a system allows users to achieve specified goals effectively, efficiently, and with satisfaction (Issa & Isaias, 2022). Usability evaluation in this study was conducted using the System Usability Scale, a ten-item Likert-scale questionnaire originally developed as a quick, practical instrument that provides a rapid overview of a system's usability without requiring elaborate laboratory testing (Utami et al., 2025). The interpretation of System Usability Scale scores in this study follows the empirically derived norms established through extensive testing across a wide range of products and systems.

These were later extended into an interpretive framework consisting of an acceptability range, an adjective rating, and a letter grade scale, as explained by Leach (2026) in a book titled *"The Rule of Law in International Development: Paradox and Practice"* (Dewi et al., 2025). Building on these norms, such benchmarks enable positioning a product's usability score relative to scores typically obtained by comparable systems (Meiners et al., 2023). In addition, general usability principles such as interface consistency, efficiency of use, and recognition rather than recall remain a relevant explanatory lens for identifying the underlying sources of usability barriers in a system (Agyemang et al., 2022).

User Experience and the HEART Framework

User experience extends beyond usability to encompass users' perceptions, emotions, responses, and experiences before, during, and after their interaction with a system (Berni & Borgianni, 2021). A system may be relatively easy to operate yet still fail to provide an enjoyable or meaningful experience, which is why a broader evaluation approach is required. The present study analyzes user experience through the HEART framework, which measures five dimensions, namely happiness, reflecting users' subjective satisfaction and attitude toward the system; engagement, reflecting the level and frequency of user involvement;

adoption, reflecting how easily and willingly new users begin using the system; retention, reflecting users' willingness to keep using the system over time; and task success, reflecting how effectively and efficiently users complete tasks within the system (Rodden et al., 2010). Because usability and user experience capture different yet complementary aspects of system quality, evaluating them together is expected to produce more precise and more actionable recommendations for improvement.

METHODS

This study employed a descriptive evaluative design with a quantitative approach and was conducted at SMA Fullday Al-Muhajirin during the even semester of the 2025/2026 academic year. The respondents consisted of fifty-five active student users of the Wayground application, selected through purposive sampling based on the following inclusion criteria: had used Wayground for at least one full semester; accessed the application at least once a week during that period; and \ had used its core features, including materials, quizzes, and evaluation activities, rather than having logged in only incidentally. These criteria were applied to ensure the data reflected the perceptions of students who had genuinely experienced the application's features, rather than those of incidental or first-time users.

The fifty-five respondents represented 138 students at SMA Fullday Al-Muhajirin who met these criteria during the even semester of the 2025/2026 academic year. Primary data were collected through a structured questionnaire that combined two instruments, an approach consistent with recommendations to evaluate usability and user experience together rather than in isolation to obtain a more complete picture of an application's quality (Hiariej & Setiyawati, 2022). The first instrument was the System Usability Scale, consisting of ten statements rated on a five-point Likert scale (Brooke, 1996). This instrument was selected because it has been shown to produce reliable and valid measurements across a wide range of systems and products, which allows its results to be interpreted with reference to well-established norms rather than in isolation (Bangor et al., 2008).

Scores were calculated following the standard System Usability Scale scoring procedure, in which the score for each odd-numbered item is reduced by one point, the score for each even-numbered item is subtracted from five, the resulting values are summed, and the total is multiplied by two and a half to produce a final score ranging from zero to one hundred, which was then interpreted using the acceptability range, adjective rating, and grade scale benchmarks established for the instrument, positioned relative to the scores typically obtained by comparable systems (Bangor et al., 2009). The second instrument was a HEART framework questionnaire developed around five dimensions, with each dimension represented by two statements rated on a five-point Likert scale, for a total of 10 items (Rodden et al., 2010).

Data were processed by calculating the mean score for each item and each dimension, which was then converted into a percentage relative to the maximum possible score of five and categorized according to established interpretation criteria. Data analysis was carried out descriptively by presenting the mean, distribution, and category of achievement for each instrument, followed by a descriptive comparative analysis of the score patterns from the System Usability Scale and the HEART framework in order to examine how usability, user

experience, and students' self-regulated learning relate to one another (Zimmerman, 2002). This study did not conduct inferential statistical testing of relationships or effects between variables.

RESULTS AND DISCUSSION

Usability Evaluation Results Using the System Usability Scale

Based on data from the 55 respondents, the mean total contribution score was 22.33, yielding a final System Usability Scale score of 55.82 for the Wayground application. The interpretation of this score is presented in **Table 1**.

Table 1. Interpretation of the SUS Score for the Wayground Application

Evaluation Metric	Result / Category
Number of respondents	55 students
Mean SUS score	55.82
Acceptability range	Marginal low
Adjective rating	OK
Grade scale	D
Gap from the industry average threshold (68.0)	-12.18 points

Source: Primary data, 2026

Based on the interpretation criteria presented in **Table 1**, the mean score of 55.82 falls into the marginal low category, with a grade of D and an adjective rating of OK, sitting 12.18 points below the industry average threshold of 68.0.

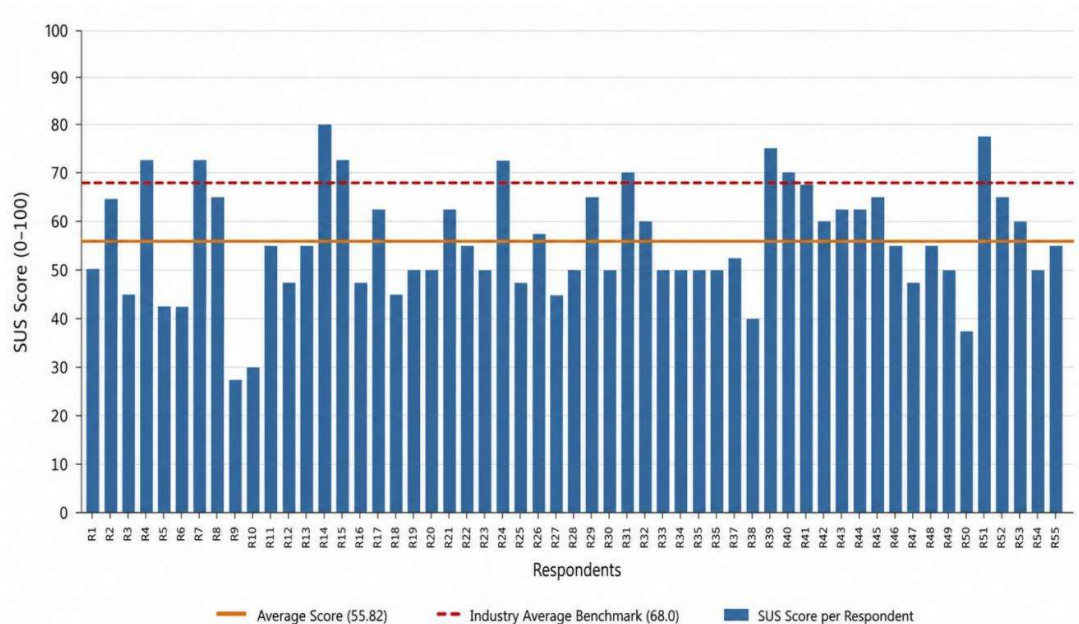


Figure 1. Distribution of SUS Scores across Respondents for the Wayground Application
Source: Primary data, 2026

Figure 1 shows that most respondents' scores fall below the 68.0 threshold line. The highest score reached 80.0, and the lowest was 27.5, indicating a fairly wide spread. This range suggests that perceptions of the Wayground application's usability are not uniform among students: a smaller group, likely those already familiar with the platform, rated the application as easy to use, while the majority encountered more substantial obstacles.

User Experience Analysis Results Using the HEART Framework

The recapitulation of the mean scores for each indicator from the 55 respondents is presented in **Table 2**.

Table 2. Recapitulation of Mean Scores per HEART Framework Indicator

Dimension	Item	Indicator	Mean	Percentage
Happiness	Q1	Satisfaction and comfort of use	3.51	70.18%
	Q2	Visual appeal and layout	3.47	69.45%
Engagement	Q3	Ease of interaction and interactive features	3.55	70.91%
	Q4	Frequency and intensity of use	3.16	63.27%
Adoption	Q5	Ease of initial operation	3.55	70.91%
	Q6	Interest in early exploration	3.36	67.27%
Retention	Q7	Willingness to keep using the app	3.49	69.82%
	Q8	Consistency of use	3.47	69.45%
Task Success	Q9	Success in completing quizzes or exercises	3.40	68.00%
	Q10	Success in completing independent activities	3.22	64.36%
Overall mean			3.42	68.36%

Source: Primary data, 2026

As shown in **Table 2**, the highest scores were on items Q3 and Q5, both with a mean of 3.55, while the lowest scores were on Q4 (3.16) and Q10 (3.22).

Table 3. Recapitulation of Achievement per HEART Framework Dimension

No.	Dimension	Mean	Percentage	Category
1	Happiness	3.49	69.82%	Good
2	Engagement	3.36	67.09%	Fair
3	Adoption	3.46	69.09%	Good
4	Retention	3.48	69.64%	Good
5	Task Success	3.31	66.18%	Fair
Overall mean		3.42	68.36%	Good

Source: Primary data, 2026 (percentages calculated from mean values prior to rounding)

The recapitulation of the achievement per dimension is presented in **Table 3**.

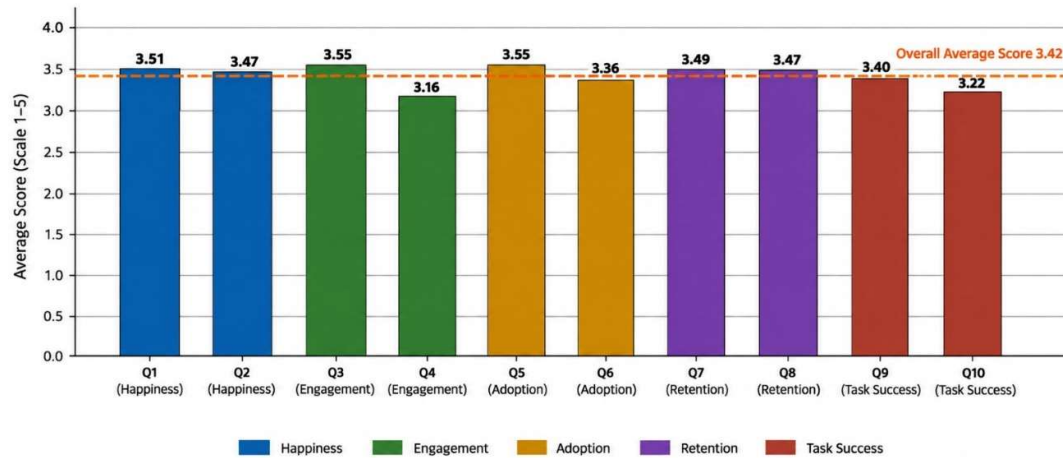


Figure 2. Mean Scores per Indicator of the HEART Framework for the Wayground Application
Source: Primary data, 2026

Figure 2 shows that all indicators fall within a range of 3.16 to 3.55, that is, around the midpoint of the scale. The two lowest indicators, the frequency of independent use and the success of completing independent activities, both relate to using the application without teacher assistance. In aggregate, the user experience score for the Wayground application was 3.42 out of 5.00 (68.36 percent), which falls into the good category (3.41 to 4.20) but sits right at its lower boundary. This position suggests that students' perceptions of using Wayground are not yet fully satisfying: students tend to rate the application neutrally to positively, without showing strong enthusiasm, a tendency consistent across all five dimensions, none of which reached the excellent category. The happiness, adoption, and retention dimensions, which relate more closely to overall impressions and willingness to keep using the application, were rated good. In contrast, the engagement and task success dimensions, which relate more closely to independent use and to completing activities without help, were rated fair and scored comparatively lower.

Table 4. Mapping of Problems, Causes, and Solutions for Improving the Wayground Application

Problem	Likely Cause	Proposed Solution
Complicated navigation and inconsistent interface (low SUS score)	Information hierarchy is not well organized; interface components such as buttons, icons, and status markers are not uniform across pages	Reorganize the information hierarchy so that core features (materials, quizzes, grades) can be reached within three steps from the home page, and standardize interface components
Weak system feedback and low Task Success achievement	No clear progress indicators or confirmation messages are provided, and error messages are not communicative	Add status and progress indicators together with success confirmation messages, and design communicative error messages with clear recovery steps
Low Engagement and Retention, minimal independent use	No engagement triggers such as notifications, competitive elements, or rewards are available to encourage access outside teacher instruction	Add gamification elements such as leaderboards, achievement badges, and streak tracking, together with scheduled notifications

Problem	Likely Cause	Proposed Solution
Low adoption of supporting features	The onboarding process does not attractively introduce supporting features to new users.	Design a brief interactive onboarding guide that introduces the application's main features when a user first logs in

Source: Research analysis, 2026

Based on the patterns observed across the System Usability Scale and HEART framework results, the problems, likely causes, and corresponding areas for improvement are mapped in **Table 4**.

Discussion

Interpretation of the Usability Findings

Referring to the interpretive framework, the System Usability Scale score of 55.82 indicates that the Wayground application has not yet reached an ideal level of usability for a digital learning application (Bangor et al., 2009). A score below the 68.0 threshold suggests that users need to expend additional cognitive effort to understand how the system works, rather than concentrating on the learning content itself. Based on the pattern of responses, this low score can be explained by learnability difficulties, since low scores on items related to ease of operation and the need for familiarization suggest that students who use the application infrequently struggle to identify the main workflow, for instance where to submit a quiz or how to return to the home page. It can also be explained by inconsistency in interface elements, as reflected in the low scores on the consistency-related items.

This indicates that some of Wayground's interface components are presented in formats that are unfamiliar to students and that reduce navigational efficiency, as stated by Nielsen (1993) in *"Usability Engineering"*. Finally, it reflects an accumulation of usage friction, since a D grade suggests that small, recurring obstacles build up over time. When students repeatedly encounter slow responses or unclear buttons, this accumulated friction can lead to reluctance to keep using the application. Compared with previous studies that evaluated the usability of education-related information systems using the System Usability Scale, the Wayground application's performance is relatively low. Systems that have not undergone iterative rounds of user testing tend to score in the marginal category. In contrast, systems that have undergone several cycles of design refinement tend to score closer to or above the industry average (Gopali et al., 2024).

A comparable pattern has been reported for navigation and interface consistency, which are frequently identified as the factors most responsible for System Usability Scale scores falling below average (Kelana et al., 2024). In a related vein, low usability scores on education-based systems have also been found to be compounded by limited testing during the development stage, since such systems are often prioritized for feature completeness rather than for user experience, a condition that appears relevant to Wayground as a large-scale learning application likely designed to meet general functional needs rather than being tailored to the specific characteristics of a particular school context (Hiariej & Setiyawati, 2022).

Comprehensive Analysis of the HEART Framework Dimensions

The HEART framework measurement provides a more detailed picture of students' perceptions and behaviors across its five dimensions. On the happiness dimension, students generally responded positively to the basic aesthetic aspects of the Wayground application, and the relatively high happiness score, despite the low System Usability Scale score, suggests that students judged the application's appearance and overall feel favorably even while encountering technical difficulties in operating it. This pattern is consistent with findings indicating that the happiness dimension tends to score higher than other HEART dimensions, as respondents often evaluate aesthetics separately from functional performance (Harmaniola et al., 2025). On the engagement dimension, the low score for the frequency of independent use indicates that students mostly opened the application only when instructed by their teacher.

This aligns with evidence that independent user engagement is strongly shaped by the presence or absence of behavioral triggers such as notifications, competitive elements, or reward systems that encourage users to return to an application without external prompting (Orozco & Crosetti, 2026). On the adoption dimension, the relatively high score for ease of initial operation alongside the comparatively lower score for interest in exploring additional features mirrors a pattern observed in the evaluation of another widely used application, in which users were generally able to learn an application's basic functions quickly but remained reluctant to explore its more advanced features when the application did not present an engaging introduction to those features at the outset (Hanum et al., 2022). On the retention dimension, students expressed willingness to continue using the application, particularly when the teacher updated materials and assignments regularly.

This is consistent with findings showing that continued use of digital learning applications among secondary school students is shaped more by teachers' teaching practices and policies than by the technical quality of the applications themselves (Orozco & Crosetti, 2026). Finally, on the task success dimension, which recorded the lowest overall achievement, the weakest indicator concerned the successful completion of independent activities, echoing evidence from an evaluation of the iPusnas digital library application showing that the task success dimension tends to be the HEART dimension most sensitive to an application's technical constraints, such as page loading speed and the clarity of system feedback, compared with dimensions shaped more by users' subjective perceptions (Fa'iqoh & Suyatno, 2024). Taken together, these dimension-level patterns show that the two weakest dimensions, engagement and task success, are closely tied to independent use of the application. In contrast, the dimensions related to first impressions, surface-level satisfaction, happiness, and adoption achieved comparatively better results.

Relationship between Usability, User Experience, and Self-Regulated Learning

The definition of the HEART dimensions is based on the comparison of results from the two instruments, which show a consistent pattern (Rodden et al., 2010). The usability score, which falls below the industry average threshold, aligns with the comparatively low achievement of the task success and engagement dimensions on the HEART framework. In contrast, the dimensions that are less dependent on smooth operation, namely happiness

and retention, achieved better results. It should be emphasized that this relationship is descriptive in nature, based on the correspondence between score patterns, and is not the result of statistical correlation testing, so it should not be interpreted as a causal relationship. The gap between the low System Usability Scale score and the comparatively favorable happiness score can be explained by a fundamental difference between the two instruments: the System Usability Scale strictly measures usability based on users' operational experience and is therefore highly sensitive to technical obstacles, whereas the happiness dimension measures subjective attitudes that are shaped more by surface-level aesthetics and by the relevance of the learning content itself.

In other words, students may genuinely like the Wayground application because its content is engaging, even as they continue to struggle with its navigation. The low engagement score is closely tied to the fact that this dimension measures actual behavior rather than mere attitude. When an application's usability is low, the extra effort students must expend to navigate it becomes an additional disincentive to independent use. Hence, students tend to use the application only when required. A similar mechanism helps explain why task success recorded the lowest achievement among the five dimensions: of all the HEART dimensions, it is conceptually closest to the definition of usability itself, which is why its trajectory mirrors that of the System Usability Scale score. This relationship carries implications for self-regulated learning through two interconnected mechanisms.

The first concerns technical cognitive load: the marginal low usability score and the low task success achievement suggest that students spend time and attention searching for menus, waiting for pages to load, or resolving failed assignment submissions, which reduces the cognitive resources available for actually understanding the learning material, consistent with the view that self-regulated learning depends on a learner's capacity to monitor and manage the learning process itself rather than external obstacles unrelated to the content (Zimmerman, 2002). The second concerns the engagement and learning initiative: the low engagement score, particularly on the indicator of independent use outside teacher instruction, suggests that the application has not yet succeeded in cultivating learning initiative, so the potential for self-regulated learning that digital media are meant to support is not yet being realized.

This pattern is broadly consistent with evidence that stronger technology skills among students tend to correspond to stronger self-regulated learning capacity (Wong et al., 2026). Consistent with earlier evidence that Indonesian students' self-regulated learning is closely tied to their ability to manage time and sustain independent motivation (Hidayat et al., 2020), the comparatively low engagement and task success scores found in this study suggest that Wayground's current usability barriers are working against, rather than supporting, the development of that capacity. Improving the usability and user experience of the Wayground application, therefore, is not merely a matter of interface aesthetics but a precondition for building a digital learning ecosystem capable of sustaining students' self-regulated learning.

CONCLUSION

This study concludes that the Wayground application has a marginal level of usability and has not yet fully met the expectations of an effective digital learning platform. Although

students generally reported a favorable user experience, the findings indicate uneven performance across the HEART dimensions, particularly in engagement and task success. The relationship between usability and user experience further suggests that difficulties in navigation, task completion, and system feedback may reduce students' willingness to use the application independently. Therefore, the current limitations of Wayground may constrain rather than optimally support students' self-regulated learning, particularly in encouraging student-initiated learning activities.

Based on these findings, improvements should prioritize the application's operational aspects before adding more complex motivational features. Simplifying navigation, improving interface consistency, strengthening system feedback, and providing clearer onboarding are recommended as the initial priorities. Subsequently, gamification and reminder features can be developed to strengthen engagement and independent use. These improvements should also be supported by teacher guidance and digital literacy development so that enhanced usability can translate into stronger self-regulated learning among students.

AUTHOR'S NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors affirm that the data and content of this article are free from plagiarism.

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