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Wordwall Based Learning Media in Earth Structure Learning: Student Engagement and Students' Perceptions

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ABSTRACT

This study examines the implementation of Wordwall-based learning media in teaching Earth Structure, focusing on student engagement and perceptions in science learning. The study was motivated by the need for interactive learning media to address students' difficulties in understanding abstract science concepts and to increase their learning motivation. A descriptive qualitative design was employed, involving eighth-grade students and science teachers as participants. Data were collected through document analysis, interviews, and questionnaires and analyzed through data reduction, data display, and conclusion drawing. The findings indicate that Wordwall created a more interactive and engaging learning environment. Students demonstrated increased enthusiasm, motivation, and participation during learning activities. Questionnaire results showed that 83.7% of students responded positively to the use of Wordwall. Students perceived game-based activities and interactive quizzes as enjoyable and helpful in understanding Earth Structure concepts. Teachers also reported that Wordwall facilitated assessment and encouraged greater student participation. Despite challenges related to internet connectivity and limited access to digital devices, Wordwall was found to be a useful digital learning medium for supporting student engagement and positive learning experiences in science education.

Keywords: Wordwall, Science Education, Student Engagement, Students' Perceptions, Digital Learning Media.

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1. INTRODUCTION

Science education is widely recognized as a cornerstone for developing students' scientific literacy, critical thinking, and problem-solving competencies. Nevertheless, several science topics at the junior secondary level remain challenging because they involve concepts that are abstract and cannot be directly experienced by learners. One such topic is Earth Structure, which requires students to comprehend the Earth's internal layers, tectonic activities, and geological processes through models, diagrams, and scientific representations. In many schools, however, instruction on this topic continues to rely heavily on teacher-centered approaches supported by textbooks and static visual materials. Such practices often provide limited opportunities for students to actively construct knowledge, resulting in lower engagement, declining learning motivation, and persistent misconceptions regarding Earth Structure (Syaifi & Murwitaningsih, 2022).

Student engagement has increasingly been recognized as a critical component of effective learning because it encompasses students' cognitive, emotional, and behavioral participation throughout the instructional process. A substantial body of educational research suggests that learners who are actively involved in classroom activities generally demonstrate stronger conceptual understanding, greater motivation, and higher academic achievement than those who participate passively (Rahmasari et al., 2022). Consequently, designing learning environments that encourage meaningful interaction has become an essential objective in science education, where conceptual mastery depends not only on receiving information but also on actively exploring scientific ideas through various learning experiences (Li et al., 2023).

The continuing advancement of educational technology has created new opportunities for teachers to redesign conventional instruction into more interactive and learner-centered experiences. Among the many digital learning applications currently available, Wordwall has gained considerable attention as a

gamification-based instructional platform capable of increasing student participation. The platform allows teachers to create a wide range of interactive learning activities, including quizzes, matching tasks, crossword puzzles, maze chase games, random wheels, word searches, and collaborative competitions (Dehghanzadeh et al., 2024).Rather than functioning merely as a medium for content delivery, Wordwall integrates multimedia resources with immediate feedback, scoring mechanisms, leaderboards, countdown timers, and repeated practice opportunities within a single learning environment. These integrated features encourage sustained attention, stimulate students' curiosity, foster healthy competition, and strengthen learning motivation throughout classroom instruction (Li et al., 2024).

Compared with other widely used gamified learning platforms, such as Kahoot and Quizizz, Wordwall provides greater instructional versatility. A single set of learning materials can be transformed into multiple interactive activity formats without requiring teachers to recreate the instructional content (Zeng et al., 2024). urthermore, the platform supports both online implementation and printable offline activities, enabling teachers to adjust learning according to classroom conditions and the availability of technological resources. Such flexibility is particularly valuable in science education, especially when teaching abstract concepts like Earth Structure that require repeated visualization, continuous reinforcement, and active student interaction to facilitate meaningful conceptual understanding (Ramírez Ruiz et al., 2024).

Growing empirical evidence has confirmed the educational value of Wordwall across different learning contexts. Bariyah and Prastowo (2024).reported that integrating Wordwall into classroom instruction significantly enhanced students' engagement and learning motivation. Saputri and Sukmawati (2024) observed increased classroom participation and a more enjoyable learning environment following the implementation of Wordwall in science lessons. Oktavia et al. (2025) also demonstrated that Wordwall effectively promoted student engagement in geography learning, while Wulandari et al (2026) found that interactive Wordwall activities improved students' understanding of science concepts. Similar findings were reported by Muh. Al Amin et al. (2026) who showed that gamification-based learning through Wordwall strengthened students' motivation and participation during classroom activities. In addition, Rachmawati et al. (2026) concluded that Wordwall contributes to more enjoyable learning experiences while simultaneously improving students' learning outcomes. Taken together, these studies consistently suggest that Wordwall is an effective digital learning medium capable of supporting active learning across various educational settings.

Although previous investigations have provided convincing evidence regarding the effectiveness of Wordwall, the majority have concentrated primarily on learning achievement, motivation, or academic performance using quantitative and quasi-experimental research designs. Comparatively little attention has been directed toward examining students' engagement during the learning process or exploring how learners perceive the implementation of Wordwall, particularly within science topics that involve abstract concepts such as Earth Structure. Moreover, limited research has examined the practical experiences and challenges encountered by both teachers and students when implementing Wordwall in authentic classroom environments through qualitative inquiry. As a result, there remains insufficient understanding of students' actual learning experiences, engagement patterns, and perceptions during the use of Wordwall-based learning media (Nur et al., 2025).

Considering these research gaps, the present study investigates students' engagement and perceptions regarding the implementation of Wordwall-based learning media in teaching Earth Structure at the junior secondary school level. Using a qualitative descriptive approach, this study aims to provide a more comprehensive understanding of how Wordwall supports active participation, facilitates meaningful science learning, and addresses practical issues that emerge during classroom implementation (Rachmawati et al., 2026). The findings are expected to contribute to the growing body of literature on gamification-based science education while offering practical recommendations for teachers seeking to integrate interactive digital media into science learning environments (Rohmani & Adelia, 2025).

2. RESEARCH AND METHOD

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This methodology section details the step-by-step timeline of our project—mapping out the overarching framework, field deployment steps, informational tools, and analytical workflows. Ultimately, a qualitative descriptive design was chosen to carefully unpack student involvement and personal attitudes surrounding the integration of Wordwall tools during Earth Structure lessons (Rachmawati et al., 2026). Opting for a qualitative lens allows researchers to truly grasp the lived experiences, reactions, and viewpoints of participants right within an authentic classroom environment. As highlighted by Sugiyono (2022:9), this line of inquiry seeks a comprehensive grasp of social dynamics, whereas descriptive studies strive to offer an orderly, fact-based portrait of current realities (Nazir, 2023:43). To this end, our inquiry sets out to map active student involvement, personal viewpoints toward the Wordwall platform, alongside the practical roadblocks encountered during field deployment (Sugiyono, 2022).

SMP Harapan Baru hosted this fieldwork during the second term of the 2025/2026 academic year. The actual participants involved a single science educator alongside thirty eighth grade students who actively interacted with the tailored Earth Structure modules via Wordwall. Architecturally, the project unfolds across three core phases namely planning, execution, and final assessment. During the initial planning phase, the team carried out exploratory background observations, cross examined relevant literature, crafted specialized diagnostic instruments, and structured the gamified activities. Following this, the execution stage focused heavily on embedding the digital platform into daily science classes while gathering evidence via student surveys, interviews, and documentation Widhiatama & Brameswari, 2024). Lastly, the final assessment phase centered on sorting, streamlining, studying, and thoroughly decoding all gathered evidence before forming conclusions regarding student involvement and views on Wordwall-based media (Sugiyono, 2022).

Information gathering relied on three core tools: surveys, semi structured dialogue, and documentation records. The primary questionnaire aimed to capture student involvement specifically mapping out focus, enthusiasm, peer collaboration, and classroom interaction alongside personal attitudes regarding how practical, appealing, and user-friendly Wordwall actually felt (Saputro & Winanto, 2024). To unlock richer perspectives, we held semi-structured dialogues with the science instructor and five student representatives diving into their real classroom experiences, views on the Wordwall rollout, and operational hurdles. Meanwhile, physical documentation captured real-time class dynamics, student participation, and tangible evidence of platform integration as lessons progressed. The specific blueprint detailing these measurement tools is outlined in Table 1 (Oktavia et al., 2025).

Table 1. Data Acquisition Instrument Grid Matrix

No	Instrument Type	Data Source Subject	Indicators Measured	Format Reference
1	Questionnaire (Likert Scale)	30 Grade VIII Students	Student engagement (participation, enthusiasm, attention, and interaction) and students' perceptions regarding the usefulness, attractiveness, and ease of use of Wordwall	Kemendikbudristek (2022:88)
2	Semi-Structured Interview Guidelines	Science Teacher & 5 Student Informants	Learning experiences, perceptions of Wordwall implementation, classroom participation, and implementation challenges	Oktavia (2025:45)
3	Field Documentation Sheet	Classroom Activities and Wordwall Platform	Learning activities, student participation, learning interactions, and evidence of Wordwall implementation	Rachamawati (2026:172)

We processed the evidence through Miles and Huberman's interactive framework a cycle spanning data collection, reduction, thematic display, and conclusion drawing (Sugiyono, 2022). Our analytical efforts centered on uncovering distinct patterns concerning active student involvement and personal viewpoints regarding Wordwall's rollout during Earth Structure lessons. To safeguard the overall rigor

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and credibility of our conclusions, the study relied on two layers of verification source and technique triangulation. The former viewpoint compared between the science teachers and their students, whereas the latter cross examined the evidence across surveys, personal dialogues, and written records. We applied these thorough cross checks to solidify the validity of our insights, offering a well-rounded perspective on how Wordwall shapes connection and perception in science learning (Panis et al., 2025).

3. RESULTS AND DISCUSSION

Here, we unpack the empirical evidence concerning active student involvement and personal viewpoints regarding the rollout of Wordwall-based media within Earth Structure lessons. Organized tables and illustrative charts layout the core data step-by-step, paired with an in depth analytical breakdown to shed much needed light on the multi faceted journey of our learners throughout this field deployment. Specifically, our evaluation closely traces how this gamified medium shifted classroom focus, curiosity, intrinsic drive, and peer communication while simultaneously capturing how practically and visually engaging the tool felt for everyday science schoolwork (Widhiatama & Brameswari, 2024).

Results

Wordwall-Based Learning Media for the Earth Structure Topic

The learning activities in this study employed a Wordwall-based instructional medium specifically designed for the Earth Structure topic in junior high school science. The platform was selected because it supports interactive, game-oriented learning experiences that encourage students to participate more actively during classroom instruction. Rather than functioning solely as a quiz application, the media integrates conceptual explanations, visual representations, and formative assessments within a single learning environment.(Maulana & Widodo, 2025).

The instructional content was organized according to the learning objectives of the Earth Structure topic. Students were introduced to the main layers of the Earth through illustrated diagrams accompanied by concise explanations describing the characteristics and functions of each layer. Following the presentation of the material, learners completed several interactive activities, including drag-and-drop labeling tasks and multiple-choice questions. These activities enabled students to reinforce their understanding while receiving immediate feedback regarding their responses (Widhiatama & Brameswari, 2024).

In addition to the learning content, the media incorporates several supporting features that improve usability and learner engagement. The interface provides navigation menus, learning instructions, progress indicators, score displays, countdown timers, and game elements that allow students to monitor their achievement throughout the lesson (Rachmawati et al., 2026). The combination of visual illustrations, interactive exercises, and instant feedback creates a more engaging learning experience and encourages students to remain actively involved during science instruction Figure 1 illustrates the interface of the Wordwall-based learning media implemented in this research.

Fig 1. Percentage Graph of Student Response Indicator Achievement for Wordwall Media

As illustrated in Figure 3, the developed Wordwall media integrates learning materials and interactive activities within a single digital platform. The interface presents visual explanations of the Earth's structure, accompanied by labeling tasks and formative quizzes that reinforce students'

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conceptual understanding. Interactive features, including score displays, timers, and progress indicators, provide immediate feedback and support active participation throughout the learning process. These features were designed to create a more engaging learning experience before evaluating students' engagement and perceptions toward the use of the Wordwall-based learning media (Ramírez Ruiz et al., 2024).

Student Engagement and Students' Perceptions toward Wordwall-Based Learning Media

Survey responses gathered from thirty eighth grade learners at SMP Harapan Baru indicate that deploying Wordwall-driven platforms noticeably boosted active involvement throughout the science lessons. This heightened connection manifests across multiple core markers namely classroom focus, excitement, hands-on participation, and peer communication as gamified challenges and interactive quizzes naturally encourage students to take a much more active role in classroom work. The numerical breakdown tracking these specific engagement levels alongside individual student attitudes is comprehensively detailed in Table 2 ((Nur et al., 2025).

Table 2. Student Engagement and Students' Perceptions toward Wordwall-Based Learning Media

No	Assessment Indicators	Percentage of Achievement	Interpretation Category
1	Student Interest	86%	Very good
2	Learning Motivation	83%	Very good
3	Ease of Use	82%	Very good
4	Understanding of Material	80%	Good
5	Classroom Participation	78%	Good

According to the outcomes recorded in Table 2, learners shared highly favorable feedback regarding Wordwall's integration. Peak scores emerged within learner curiosity markers (86%), followed closely by academic drive (83%) and overall platform accessibility (82%) proving that this tool successfully fostered a highly dynamic, participatory classroom atmosphere. Furthermore, strong metrics in conceptual comprehension (80%) along with daily class engagement (78%) demonstrate that students remained thoroughly invested and gained immensely rewarding educational experiences throughout this study. These identical trends are visually mapped out for comparison in Figure 2.

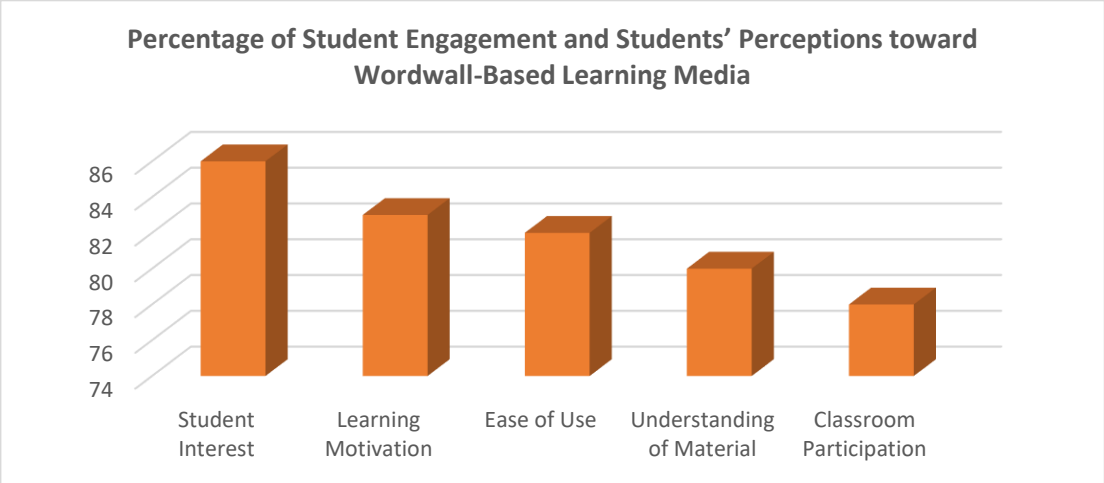

Fig 2. Percentage Graph of Student Response Indicator Achievement for Wordwall Media

As visually depicted, learner curiosity emerged as the peak metric, outstripping scholastic drive and seamless usability. Taken together, every marker fell into the favorable or highly favorable tier

proving that children viewed Wordwall positively while showcasing active immersion during the Earth Structure sessions.

Qualitative feedback from discussions further cemented these favorable attitudes regarding this application's role in science education. A majority of learners noted that the system rendered classes were much more fun, dynamic, and free from traditional monotony. They highly valued the gamified setup since it sparked deep fascination and drove hands on participation during school hours. Additionally, the children felt that Wordwall's rich visual and responsive features actively anchored their educational journey. Integrating diagrams, short tests, and real time feedback helped them unpack the Earth Structure topics much more easily. Finally, they noted that leaderboard dynamics spiked their competitive drive, encouraging everyone to join in. (Dehghanzadeh et al., 2024).

Complementing student views, the science educator highlighted favorable outcomes from the Wordwall rollout noting that the tool streamlined classroom coordination, eased the grading workload, and spurred active learner involvement. Such insights demonstrate that the platform acts as a dual-purpose asset: fostering student connections while offering tangible, timesaving benefits for teachers navigating daily lessons (Syaifi & Murwitaningsih, 2022).

Challenges in Implementing Wordwall-Based Learning Media

While the implementation yielded encouraging results, it was not without its hurdles. The foremost obstacle was unstable internet access, which occasionally disrupted students' engagement with learning materials. Furthermore, a shortage of digital devices restricted the involvement of several participants. These issues were heavily reflected in the interviews with both educators and students, underscoring that technical readiness remains a pivotal factor in executing digital learning initiatives (Rohmani & Adelia, 2025).

To mitigate these issues, students were advised to collaborate in pairs or small teams whenever there was a shortage of devices. Additionally, targeted time management practices were introduced to guarantee that learning goals were met efficiently, all while keeping the students actively invested throughout the entire session (Oktavia et al., 2025).

Discussion

The findings demonstrate that the implementation of Wordwall positively influenced students' learning experiences during the Earth Structure lesson. This conclusion is supported by the high percentage of students reporting increased learning interest (86%), motivation (83%), and active classroom participation (78%). These results suggest that integrating interactive and game-based learning activities encouraged students to engage more actively with the instructional content rather than acting as passive recipients of information. The combination of visual representations, immediate feedback, and interactive challenges appears to have contributed to maintaining students' attention and participation throughout the learning process (Li et al., 2023).

The positive responses observed in this study are consistent with previous research indicating that gamification can enhance learners' motivation and classroom engagement (Sari, 2023; Wardani, 2022). In particular, the Earth Structure topic contains several abstract concepts that are difficult to observe directly. The use of visual diagrams and interactive exercises within the Wordwall platform may therefore assist students in connecting theoretical explanations with visual representations, making scientific concepts easier to understand. Furthermore, the immediate feedback provided after each activity allows students to identify incorrect responses and improve their understanding during the lesson (Nur et al., 2025).

Another noteworthy finding is that 82% of students considered the platform easy to use. This percentage indicates that most participants experienced little difficulty navigating the learning activities despite interacting with a digital platform. Ease of use is an important factor because students can devote more attention to understanding the lesson content instead of learning how to operate the application. Consequently, the instructional process becomes more efficient and creates opportunities for greater classroom interaction between teachers and students (Zeng et al., 2024).

Despite these encouraging findings, several limitations should also be considered. The effectiveness of Wordwall depends on the availability of reliable internet access and appropriate digital devices. In classrooms where connectivity is unstable or devices are limited, students may experience interruptions that reduce the continuity of learning activities. Moreover, because Wordwall incorporates competitive game elements, some learners may focus more on achieving high scores than on developing

a comprehensive understanding of the concepts being studied. If not accompanied by teacher guidance and reflective discussion, this tendency may reduce opportunities for deeper conceptual learning.

Nevertheless, the limitations identified in this study did not appear to substantially influence the overall learning outcomes. The consistently high percentages of students' interest (86%), motivation (83%), classroom participation (78%), and perceived ease of use (82%) indicate that the educational benefits of the platform outweighed the technical challenges encountered during implementation. These findings suggest that Wordwall can serve as an effective instructional medium when supported by adequate technological infrastructure and appropriate pedagogical strategies (Rahmasari et al., 2022).

Overall, this study highlights that Wordwall extends beyond its function as an interactive assessment platform. By integrating gamification, visual learning resources, and continuous feedback, the platform creates a more engaging learning environment that supports students' conceptual understanding and active participation in science learning. Future research is recommended to examine its long-term effects on learning achievement, knowledge retention, and higher-order thinking skills across different science topics and educational settings.

4. CONCLUSION

This research investigated how the integration of Wordwall as a digital learning tool influences student engagement and attitudes during lessons on Earth Structure. The empirical data indicates a strong positive impact on science education, highlighted by high metrics across several indicators: student interest reached 86%, learning motivation stood at 83%, user-friendliness was rated at 82%, conceptual comprehension hit 80%, and active classroom participation sat at 78%. These outcomes are largely driven by Wordwall's gamified and interactive elements, which successfully stimulated student involvement and established a dynamic classroom atmosphere. Ultimately, learners regarded the platform as an appealing and efficient resource that enriched their educational journey and clarified complex geological concepts. While infrastructure hurdles like erratic internet connections and limited device access were noted, they did not overshadow Wordwall's utility in driving engagement and positive feedback. Moving forward, subsequent studies should explore the platform's efficacy across diverse scientific subjects and varied educational settings.

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