

## Wordwall and Interactive Flat Panel (IFP) as Student-Centered, Deep Learning-Based Media for Islamic Education in Elementary Schools

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### Abstract

Low student participation and motivation in Islamic Religious Education (IRE) learning at the elementary school level remain pressing pedagogical challenges in the digital era. This study offers a distinctive contribution through the integration of two technological platforms simultaneously Wordwall as a gamification-based learning medium and the Interactive Flat Panel (IFP) as a touch-based interactive display within a structured and student-centered IRE learning ecosystem. Unlike previous studies that have examined educational technologies separately, this research explores the synergy between these two platforms in fostering deep learning, understood in a pedagogical context as students' ability to analyze, reflect upon, and meaningfully internalize concepts rather than merely memorize them. The study was conducted at SDN 1 Bulusulur, Wonogiri, Central Java, Indonesia. A qualitative descriptive approach was employed through structured observations, in-depth interviews, and documentation studies. Data were analyzed using the Miles and Huberman interactive model. The findings reveal three significant outcomes: (1) students' active engagement increased substantially, as evidenced by higher frequencies of responses and interactions during the learning process; (2) students' understanding of Islamic values developed from a memorization-based level to the contextual application of concepts in their daily lives; and (3) the learning environment shifted from a one-way transmission model to a collaborative and reflective model centered on students' learning experiences. These findings demonstrate that the synergy between Wordwall and the Interactive Flat Panel effectively bridges the gap between digital technology and the deep internalization of spiritual values in Islamic Religious Education at the elementary school level.

**Keywords:** Deep Learning, Interactive Flat Panel, Islamic Religious Education, Student-Centered Learning, Wordwall.

### Abstrak

*Rendahnya partisipasi dan motivasi siswa dalam pembelajaran Pendidikan Agama Islam (PAI) di sekolah dasar merupakan tantangan pedagogis yang mendesak di era digital. Penelitian ini hadir dengan keunikan pada pengintegrasian dua platform teknologi sekaligus Wordwall sebagai media gamifikasi dan IFP sebagai layar interaktif berbasis sentuh dalam satu ekosistem pembelajaran PAI yang terstruktur dan berorientasi pada siswa (student-centered learning). Berbeda dari penelitian sejenis yang mengkaji teknologi secara tunggal, studi ini mengeksplorasi sinergi kedua platform tersebut dalam mendorong pembelajaran mendalam (deep learning dalam konteks pedagogis: kemampuan siswa menganalisis, merefleksi, dan menginternalisasi konsep secara bermakna, bukan sekadar mengingat), yang dilaksanakan di SDN 1 Bulusulur, Wonogiri, Jawa Tengah. Penelitian menggunakan pendekatan deskriptif kualitatif melalui observasi terstruktur, wawancara mendalam, dan studi dokumentasi, dengan analisis data model interaktif Miles dan Huberman. Hasil penelitian mengungkapkan tiga temuan konkret: (1) tingkat keterlibatan aktif siswa meningkat signifikan yang ditandai dengan frekuensi respons dan interaksi yang lebih tinggi selama pembelajaran berlangsung; (2) pemahaman konsep nilai-nilai keislaman siswa berkembang dari level hafalan menuju level aplikasi kontekstual dalam kehidupan sehari-hari; dan (3) suasana belajar bergeser dari pola transmisi satu arah menjadi pola kolaboratif-reflektif yang berpusat pada*

*pengalaman belajar siswa. Temuan ini menegaskan bahwa sinergi Wordwall dan IFP mampu menjembatani kesenjangan antara teknologi digital dan pendalaman nilai spiritual dalam pembelajaran PAI di sekolah dasar.*

**Kata kunci:** *Pembelajaran Mendalam, Interactive Flat Panel, Pendidikan Agama Islam, student-centered learning, Wordwall.*

## INTRODUCTION

The transformation of learning in the digital age demands the integration of technology not merely the adoption of modern devices, but a shift in the learning paradigm from teacher-centered to student-centered (Muliarta, 2018; Nisa et al., 2024). However, this paradigm shift has not been uniformly implemented across all educational institutions, including in the subjects of Islamic Religious Education (IRE) and Character Education at the elementary school level (Jang et al., 2024). Based on initial observations conducted at SDN 1 Bulusulur, Wonogiri, Central Java, it was found that PAI instruction is still dominated by one-way lecture methods, with low levels of active student participation marked by minimal verbal responses, low enthusiasm for completing assignments, and limited peer-to-peer discussion during the learning process. This situation indicates a gap between the learning objectives of PAI which aim for the deep internalization of values and the actual teaching practices taking place in the classroom.

The transformation of learning in the digital age demands the integration of technology not merely the adoption of modern devices (Fuadi et al., 2026; Mubiarto, 2025), but a shift in the learning paradigm from teach (Mustofa & Hindun, 2023). This paradigm shift is particularly crucial in the disruption era, where educators must continuously adapt their pedagogical mindset to remain relevant (Wijaya, 2019) emphasizes that Islamic Religious Education teachers must transform their thinking paradigm to effectively navigate the complex challenges of digital disruption, positioning technology as a central catalyst for meaningful learning rather than a mere supplementary tool. Consequently, integrating platforms such as Wordwall and IFP is not merely a technological upgrade, but a fundamental necessity to align classroom practices with the true objectives of deep learning.

The research problem focuses on two main questions: how are the Wordwall and Interactive Flat Panel (IFP) platforms integrated into PAI instruction at SDN 1 Bulusulur, and what are the implications of this integration for students' active engagement and depth of conceptual understanding? This problem stems from the concrete phenomenon that sixth-grade students at SDN 1 Bulusulur exhibit a tendency toward passivity in PAI learning, while teachers face limitations in selecting

and operating digital learning media relevant to the characteristics of religious education.

Theoretically, this study is grounded in three mutually supportive frameworks. First, the theory of deep learning from a pedagogical perspective, developed by (1997) and updated in the context of 21st-century education by (Andayanie et al., 2025). Deep learning is defined as a pedagogical approach that encourages students not merely to memorize, but to analyze, reflect on, and meaningfully internalize concepts a process that is explicitly distinct from the term “deep learning” in artificial intelligence. Second, the theory of student-centered learning, which positions students as active agents who construct their own knowledge through interaction, collaboration, and reflection (Pearce et al., 2023). Third, the theory of technology-enhanced learning, which asserts that interactive digital media can expand opportunities for students’ cognitive engagement when designed in alignment with learning objectives (Bankole & Ayanwale, 2025). The Wordwall platform is a web-based learning tool that offers flexible interactive activities including quizzes, games, and assessments for various subject areas, there by potentially increasing student engagement in the learning process (Kusnadi & Azzahra, 2024). Meanwhile, the Interactive Flat Panel (IFP), as an interactive touchscreen device, enables the dynamic integration of digital content into teaching and learning activities, while replacing conventional, static whiteboards (Yolanda et al., 2025).

Previous studies have examined Wordwall separately for cross-curricular interactive learning (Utami, 2024; Yolanda et al., 2025), as well as IFP as a general replacement for conventional media. However, there is a significant research gap, and no study has specifically integrated these two learned media within a single, student-centered deep learning framework in the context of Islamic Education (PAI) in Indonesian elementary schools. This gap is all the more critical given that PAI has unique characteristics that demand not only content understanding but also the internalization of moral, spiritual, and ethical values, which require a more in-depth pedagogical approach compared to other subjects.

Based on this gap, this study aims to analyze the use of the Wordwall and IFP platforms as PAI learning media based on a student-centered, deep learning approach at SDN 1 Bulusulur, Wonogiri, while also examining their implications for students’ active engagement and depth of conceptual understanding. An in-depth exploration of phenomena occurring naturally in the field aligns with the interpretive paradigm underpinning the qualitative descriptive approach.

## RESEARCH METHODS

This study employs a descriptive qualitative approach with a naturalistic inquiry design to deeply explore the process of integrating the Wordwall platform and the Interactive Flat Panel (IFP) into Islamic Religious Education (PAI) instruction oriented toward deep learning pedagogy and student-centered learning. A qualitative approach was chosen because this study emphasizes understanding the processes, meanings, and dynamics of learning interactions in context rather than measuring numerical outcomes (Sulastri et al., 2025). Therefore, this study did not use a pretest-posttest design but instead focused on holistic observation of the learning process in natural classroom settings.

The study was conducted at SD Negeri 1 Bulusulur, Wonogiri, Central Java, which was selected through purposive sampling because the school has integrated IFP as digital infrastructure and actively utilizes Wordwall in PAI instruction. Research participants were selected through purposive sampling and consisted of one sixth-grade PAI teacher with at least two years of experience using digital media, seventeen sixth-grade A students, and the school principal as a supporting informant.

The primary research instrument was the researcher herself, supported by three secondary instruments: (1) a structured observation sheet containing indicators of student engagement and interaction patterns during learning; (2) a semi-structured interview guide developed based on deep learning theory; and (3) a documentation sheet for recording learning activities, such as recordings of Wordwall activities, IFP sessions, and teacher instructional materials. Data were collected through methodological triangulation, which included passive participatory observation during eight learning sessions, individual and focused semi-structured interviews, and a documentation study of teaching materials and the researcher's field notes.

Data analysis was conducted inductively using the interactive analysis model by Miles and Huberman (Alberti et al., 2024), which comprises four stages: data collection, data condensation, data presentation, and drawing conclusions and verification. Data validity was ensured through four strategies of qualitative validity (Lincoln & Guba, 1985), namely credibility through source triangulation, transferability through detailed contextual descriptions, dependability through documentation of the research trail, and confirmability through researcher reflexivity recorded in a reflective journal (Sugiyono, 2022a).

## RESULTS AND DISCUSSION

### Deep Learning-Based PAI Instructional Design with Integration of Wordwall and IFP (Interactive Flat Panel)

The implementation of PAI instruction at SD Negeri 1 Bulusulur was designed through a systematic approach that integrates the Wordwall platform and the Interactive Flat Panel (IFP) within a student-centered deep learning framework. The instructional design was developed through three main stages: collaborative planning between the researcher and PAI teachers, the development of interactive digital content, and the implementation of instruction using a structured classroom rotation model. Research on the use of the Wordwall and Interactive Flat Panel (IFP) platforms in PAI instruction at SDN 1 Bulusulur indicates an increase in student engagement and enthusiasm during the teaching and learning process. Instruction, which was previously conventional, has become more interactive and collaborative. Islamic Education teachers used Wordwall as the primary medium for religious quizzes, Islamic vocabulary games, and learning assessments integrated with the IFP. Through these tools, students appeared more active and confident in expressing their opinions.

Furthermore, the implementation of Wordwall extends beyond engaging instructional games; it serves as a robust instrument for learning assessments and interactive quizzes. By utilizing gamified evaluation features, the process of assessing students' comprehension of Islamic concepts becomes significantly more dynamic, thereby reducing the psychological pressure typically associated with conventional testing methods. Students participate in these assessments with heightened enthusiasm, viewing them as collaborative challenges rather than formal exams. This practice is strongly supported by (Rahayu et al., 2023; Supratama et al., 2025), whose research highlights that the integration of web-based applications in Islamic education assessment systems effectively enhances evaluation efficiency while providing a highly interactive experience for students. Consequently, deploying Wordwall as an assessment tool within the IFP ecosystem not only measures cognitive achievement but simultaneously reinforces active participation within the student-centered learning paradigm (Supratama et al., 2025).

This study was conducted in a primary school over three teaching cycles, utilising a game-based digital tool (Wordwall) and the Integrated Field Project (IFP) approach. The research subjects consisted of 17 sixth-grade students. Data collection was carried out through participant observation, written tests (pre-tests and post-tests), activity observation sheets, pupils' reflection journals, and teacher interviews. Data analysis utilised a mixed-methods approach to obtain a comprehensive picture of the intervention's effectiveness. This Classroom Action Research (CAR) was based on the model proposed by Kemmis and McTaggart (Siregar, 2025), which consists of

four cyclical stages: planning, acting, observing, and reflecting. Each cycle lasted three weeks, with two sessions per week. Reflection between cycles was used as the basis for refining the lesson plans for the subsequent cycle.

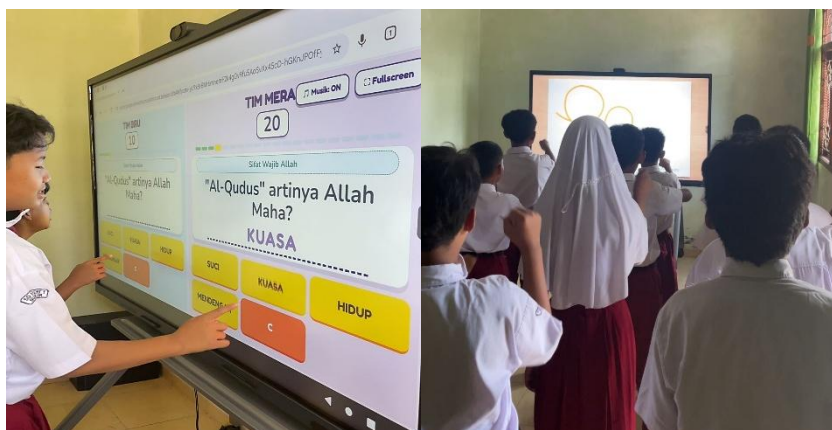
Observation results show that PAI learning activities are conducted according to a regular IT room schedule so that every class has the opportunity to use IFP devices and access Wordwall. The IT room visit schedule is arranged by PAI teachers in collaboration with the school’s ICT team and the Principal of SD N 1 Bulusulur, as shown in the following table:

**Table 1. IT Lab Visit Schedule for SDN 1 Bulusulur**

Class	Visiting Day	Time	Islamic Education Learning Activities
I	Monday	08.00–09.00	An Introduction to the Asmaul Husna using Wordwall
II	Tuesday	08.00–09.00	Interactive game on the pillars of Islam
III	Wednesday	09.00–10.00	A quiz on virtuous behaviour based on Wordwall
IV	Thursday	09.00–10.00	Assessment of the memorisation of short surahs
V	Friday	08.00–09.00	A discussion on the values of worship with IFP
VI	Friday	09.00–10.00	Learning reflections and weekend quiz

This schedule takes into account the limited capacity of the IT room as well as the need for continuous learning at each grade level. PAI teachers develop Wordwall learning content tailored to the characteristics of the material and the cognitive development level of students in each grade. For lower grades such as first and second grade, the selected activities tend to be visual-interactive, such as “Match Up,” “Quiz,” and “Random Wheel,” which facilitate the introduction of basic concepts through games. Meanwhile, for upper grades such as fifth and sixth, the activities used are more complex, such as “Labelled Diagram,” “Group Sort,” and “Open the Box,” which encourage the analysis and application of concepts in the context of daily life.

Figure 1. Documentation of the Use of the Wordwall and Interactive Flat Panel



Classroom observations show that the integration of Wordwall and IFP creates a classroom dynamic that is significantly different from conventional learning. One PAI teacher explained:

"Previously, the students seemed very passive and got bored quickly when I explained the material using the lecture method and note-taking. But since I started using the Wordwall game on the IFP screen, they've been very enthusiastic and excited. They scramble to come to the front to touch the screen, answer questions, and even the usually quiet ones have started actively participating. I can see that they're not just memorizing the material, but truly understanding it because they're directly engaged in the learning process" (Interview, 2026).

Observational data also shows that the deep learning-based model fosters reflective thinking skills. Students do not merely memorize concepts but also understand the meaning of the religious values they are learning. This finding supports (Lisandra et al., 2025; Suteja et al., 2025a) research, which affirms that deep learning-based instruction encourages students to understand concepts deeply and connect them to real-life experiences. Furthermore, the implementation of student-centered learning positions the teacher as a facilitator who guides students in discovering meaning, rather than merely a conveyor of information (Aji et al., 2023; Andayanie et al., 2025).

Interpretation of the results indicates that the synergy between technology and modern pedagogical approaches can improve the quality of Islamic Education (PAI) learning. This aligns with the findings, which state that the use of Interactive Flat Panels provides a more dynamic visual learning experience, while Wordwall enhances interactivity through educational games based on healthy competition.

### **Increasing Students' Active Engagement in Learning**

One of the key findings of this study is the increase in students' active participation during Islamic Education (PAI) lessons using Wordwall and IFP. Before implementing these tools, teachers noted that most students tended to be passive, merely listening without much interaction. However, after implementing these digital tools, students appeared more enthusiastic, competed with one another to answer questions, and were more willing to voice their opinions.

"During lessons using Wordwall which was then displayed on the IFP screen the children scrambled to try answering. They weren't just focused on grades, but enjoyed the learning process with their friends and, of course, were confident enough to give it a try" (Interview, 2026).

This increase in engagement demonstrates that the use of digital media can address boredom in religious education, which is often perceived as monotonous. This aligns with the view of (Andayanie et al., 2025), who assert that student-centered learning is effective when students are given opportunities to participate through media that support two-way communication and active learning experiences. Thus, Wordwall and the IFP are not merely visual aids but serve as tools to strengthen educational interaction between teachers and students.

### **Improved Conceptual Understanding and Reflective Learning**

Students' conceptual understanding was measured through tests designed based on the revised Bloom's Taxonomy by Anderson and Krathwohl (Anggoro et al., 2019), covering the cognitive levels of recall (C1), understanding (C2), application (C3), and analysis (C4). The tests were administered as a pretest before implementation and a posttest after eight weeks of instruction, with a total of 30 questions distributed proportionally across each cognitive level.

Students not only understood the material cognitively but also demonstrated a more reflective understanding of the values being taught. For example, in on the topic of ethics toward others, the teacher presented the "Choose the Right Action" game on Wordwall. Students were able to explain the moral reasoning behind each choice they made, demonstrating deep learning that connects religious concepts to the realities of their lives. These findings reinforce theory that deep learning enables students to fully integrate cognitive and affective aspects. Furthermore, research results from (2024) indicate that the use of IFP supports the visualization of abstract concepts into more concrete forms through engaging interactive displays (Fauzi & Hasan, 2025; Suteja et al., 2025b).

A qualitative analysis of students' responses on the post-test revealed a more profound shift in their thinking patterns. When asked to explain the wisdom behind zakat, students' answers on the pretest tended to be normative, such as "to enter paradise" or "because it is Allah's command." However, on the post-test, students were able to provide more comprehensive explanations that linked the concept of zakat to social justice, empathy, and communal responsibility. A sixth-grade student answered:

"Zakat is not only an obligation of the wealthy toward Allah, but also a right of the poor that must be fulfilled. If everyone paid zakat properly, no one would go hungry, and social inequality could be reduced. Zakat teaches us not to be selfish and to care for others (Post-test Results, 2026)."

This response indicates that students not only understand the definition of zakat cognitively but are also able to analyze its social implications and relate them to

universal values such as justice and solidarity. This ability is an indicator of deep learning as conceptualized by Fullan and Langworthy (Marzuki et al., 2025), in which students develop understanding that can be transferred to new contexts and is meaningful to their lives.

The role of Wordwall and the IFP in enhancing conceptual understanding is clearly evident in the learning process. The “Labelled Diagram” activity on Wordwall helps students visualize abstract concepts such as the procedures for wudhu or prayer positions in an interactive way. Students can drag and drop labels onto images displayed on the IFP, creating a multisensory learning experience that facilitates stronger information encoding. The “Group Sort” activity encourages students to categorize concepts, such as grouping virtuous character traits and

### **Implications for PAI Learning Innovations in Elementary Schools**

This study suggests that technology-based learning innovations do not conflict with Islamic educational values; rather, they serve as an effective means of instilling religious teachings in a way that is more adaptable to the changing times. The PAI teacher at SDN 1 Bulusulur emphasized that the use of Wordwall and the IFP makes the learning process feel more engaging and relevant for digital native students. These findings align with (Sugiyono, 2022) perspective, which emphasizes the importance of innovating teaching methods and media to enhance the effectiveness of learning outcomes. Furthermore, this type of student-centered learning helps teachers transition from being the sole source of information to becoming facilitators who guide students in discovering the meaning of each topic (Minalla, 2023).

Furthermore, this type of student-centered learning helps teachers transition from being the sole source of information to becoming facilitators who guide students in discovering the meaning of each topic. This transformative role is intrinsically aligned with the core principles of Islamic education. As (Nurchamidah et al., 2023) articulate from a Quranic perspective, a teacher's professionalism in the modern learning process fundamentally involves acting as a facilitator, motivator, and learning engineer who not only transfers knowledge but also purifies students' morals and refines their cognitive reasoning. By utilizing the interactive ecosystems of IFP and Wordwall, teachers are empowered to fulfill this multifaceted role, seamlessly bridging the gap between digital development and the internalization of Islamic values.

Overall, the results of this study address the research questions and objectives that were formulated. The use of Wordwall and IFP was proven to increase student participation, deepen conceptual understanding, and steer PAI learning toward a student-oriented deep learning paradigm. This approach can serve as an innovative

model for other elementary schools in developing religious education that is more active, reflective, and relevant to technological advancements.

Therefore, the integration of Wordwall and IFP not only strengthens student engagement but also encourages students to understand the spiritual meaning of PAI material in a deep and contextual manner. These results confirm the initial hypothesis that deep learning-based instruction supported by digital media can foster meaningful and reflective learning processes in elementary schools.

## CONCLUSION

This study makes an important contribution to the development of innovative Islamic Religious Education (PAI) by demonstrating that the integration of digital technologies such as Wordwall and Interactive Flat Panels (IFP) can serve as effective tools for realizing deep learning-based instruction oriented toward student-centered learning. The implications of these findings suggest that technology-based pedagogical approaches not only increase student engagement but can also reinforce spiritual values through reflective and meaningful learning experiences. This study reaffirms that technology, when used appropriately, can bridge the gap between digital development and the internalization of Islamic values in the context of elementary education.

## AI USE DECLARATION

In the preparation of this article titled Wordwall and IFP as Student-Centered, Deep Learning-Based Media for Islamic Education in Elementary Schools, the authors utilized AI for the purposes of grammar checking, language refinement, structural editing, and improving the overall clarity and readability of the manuscript. Following the use of this AI-assisted tool, the authors thoroughly reviewed, verified, and edited all to ensure its accuracy, relevance, and alignment with the intellectual objectives of this publication. The authors take full and sole responsibility for the integrity, originality, and overall content of this article. The use of AI tools in this article was limited to language and editorial assistance only, and did not involve the generation of research data, findings, analysis, or conclusions. All scholarly contributions, arguments, and interpretations presented herein are entirely the work of the authors.

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