AL-ADABIYAH: Jurnal Pendidikan Agama Islam
http://al-adabiyah.uinkhas.ac.id/

Students' Perceptions and Learning Experiences with Smartboard-Supported Islamic Religious Education: A Qualitative Study

Bayu Segara,[1*] Rini Rahman[2]
*bsegara259@gmail.com
[1,2] Universitas Negeri Padang, Indonesia

Abstract

This study investigates students' perceptions and learning experiences with Smartboard-supported Islamic Religious Education and explores the factors shaping these perceptions in a senior high school context. A descriptive qualitative design was employed at SMA Negeri 1 Pariaman, Indonesia, between May and June 2026. Participants were purposively selected and consisted of ten Grade XI F2 students, one Islamic Religious Education teacher, and one vice principal for curriculum affairs. Data were collected through classroom observations, semi-structured interviews, and documentation, and analyzed using the interactive model of Miles, Huberman, and Saldaña, involving data condensation, data display, and conclusion drawing. The trustworthiness of the findings was established through source and method triangulation and member checking. The findings reveal that students generally developed positive perceptions of Smartboard-supported learning through three interrelated stages: receiving, understanding, and evaluation. Smartboard enhanced students' affective, cognitive, and social learning experiences by increasing classroom engagement, conceptual understanding, collaborative participation, and access to diverse digital learning resources. Students' perceptions were shaped by the interaction of perceiver factors (learning preferences), target factors (interactive multimedia features and internet connectivity), and situational factors (teacher competence, school policy, and technological infrastructure). Unlike previous studies that primarily emphasized learning outcomes or technology acceptance in general education, this study qualitatively integrates Walgito's perception theory and Robbins and Judge's Perceiver–Target–Situation framework to explain students' learning experiences within Smartboard-supported Islamic Religious Education. The study enriches theoretical discussions on digital pedagogy in religious education and provides practical recommendations for integrating interactive technologies through pedagogically meaningful, student-centered learning environments.

Keywords: Smartboard; Student Perceptions; Learning Experiences; Islamic Religious Education; Digital Pedagogy

Introduction

The rapid advancement of digital technology has fundamentally transformed educational practices in the twenty-first century, shifting learning paradigms from teacher-centered instruction toward interactive, student-centered, and technology-enhanced learning environments. Consequently, teachers are increasingly expected to integrate digital technologies that not only facilitate knowledge delivery but also promote active participation, collaboration, critical thinking, and meaningful learning experiences (Fajriyah, 2022). Recent studies demonstrate that digital learning environments contribute positively to students' behavioral engagement, motivation, and academic achievement when technological tools are effectively integrated with sound pedagogical practices (Bergdahl et al., 2020; Hou & Li, 2026; Long et al., 2026). Rather than functioning merely as instructional aids, digital technologies are increasingly recognized as pedagogical instruments capable of transforming classroom interaction and enriching students' learning experiences through multimodal engagement (Bunjaku et al., 2024; Chauhan & Patel, 2026).

Among various educational technologies, the Smartboard, also known as the Interactive Flat Panel (IFP) or Interactive Whiteboard (IWB), has emerged as one of the most promising innovations for creating interactive learning environments. Unlike conventional projectors that primarily support one-way information delivery, Smartboards enable real-time interaction through touch-screen technology, multimedia integration, digital annotation, collaborative problem-solving, and immediate feedback, thereby encouraging greater student participation and classroom interaction (Yunita & Gunawan, 2024; Chien, 2024; Drigas & Papanastasiou, 2014). Empirical evidence consistently suggests that Smartboard-supported instruction enhances students' motivation, classroom participation, learning engagement, and conceptual understanding across various educational contexts (Barbarić Pardanjac et al., 2018; Jia, 2025; Kasa et al., 2024). Furthermore, interactive digital technologies have been shown to foster richer learning experiences by combining visual, auditory, and kinesthetic learning modalities, enabling students to actively construct knowledge rather than passively receive information (Made Rajendra & Made Sudana, 2018; Zhou & Yang, 2024).

Nevertheless, the successful implementation of Smartboard technology extends beyond the mere availability of digital infrastructure. Previous research indicates that students' learning experiences are strongly influenced by teachers' pedagogical competence, digital literacy, instructional design, and the perceived usefulness and ease of technology use (Mustafa et al., 2025). Studies grounded in the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) further demonstrate that learners are more likely to engage with educational technologies when they perceive them as useful, easy to operate, and supportive of their learning needs (Nguyen & Nguyen, 2024; Alnaqeeb et al., 2025; Aldiabat et al., 2024). Consequently, understanding students' perceptions has become increasingly important because positive perceptions not only facilitate technology

acceptance but also shape students' engagement, motivation, and overall learning experiences within digitally mediated classrooms (Hou & Li, 2026; Yaseen et al., 2025).

The integration of digital technologies is particularly significant in Islamic Religious Education because this subject not only aims to develop students' cognitive understanding of Islamic teachings but also seeks to cultivate moral values, religious attitudes, and character formation through meaningful learning experiences. Nevertheless, classroom practices in IRE continue to rely heavily on conventional teacher-centered approaches, where lectures and textbook-oriented instruction remain dominant, limiting students' opportunities to actively construct knowledge and relate religious concepts to authentic life situations (Zahara et al., 2026). This pedagogical tendency contrasts with the expectations of the twenty-first century curriculum, which emphasizes active learning, collaboration, creativity, and digital competence alongside character education (Rambe et al., 2024). Consequently, the adoption of interactive learning technologies such as Smartboards presents an opportunity to redesign IRE instruction into a more engaging, contextual, and student-centered learning process.

Within this context, the role of Islamic Religious Education teachers extends beyond transmitting religious knowledge to facilitating interactive learning experiences supported by digital technology. As educational technologies become increasingly integrated into classroom practice, teachers are expected to combine pedagogical competence with digital literacy to design meaningful learning activities that encourage discussion, reflection, collaboration, and critical thinking. Previous studies indicate that teachers' instructional strategies substantially influence students' engagement and learning experiences when digital technologies are employed in classroom settings (Anggun Oktavia, 2021; Hou & Li, 2026). Likewise, interactive digital learning environments supported by multimedia resources, real-time feedback, and collaborative activities have consistently been associated with higher levels of behavioral engagement, motivation, and learning satisfaction (Saleh & Mohamed, 2025; Yaseen et al., 2025; Long et al., 2026). These findings imply that the effectiveness of Smartboard-supported learning depends not merely on technological availability but on how teachers orchestrate learning interactions that connect technology, pedagogy, and instructional objectives.

Although studies concerning Smartboards and other interactive educational technologies have increased considerably during the past decade, existing research demonstrates several important limitations. First, previous studies have predominantly focused on measuring academic achievement, learning outcomes, technology adoption, or student satisfaction using quantitative approaches (Kasa et al., 2024; Nguyen & Nguyen, 2024; Wang et al., 2025). Second, investigations are largely concentrated in science, engineering, mathematics, and language education, while studies examining digital technology implementation within Islamic Religious Education remain relatively scarce (Drigas & Papanastasiou, 2014; Jia, 2025). Third, most

previous investigations emphasize the effectiveness of technology itself rather than exploring how students personally interpret, experience, and construct meaning from technology-supported learning activities. Yet, contemporary educational research argues that students' perceptions and learning experiences represent critical dimensions because they influence technology acceptance, classroom engagement, motivation, and ultimately learning effectiveness (Bergdahl et al., 2020; Berger et al., 2025; Hou & Li, 2026). These limitations indicate that understanding students' lived experiences within Smartboard-supported Islamic Religious Education requires further qualitative investigation capable of revealing dimensions that cannot be adequately captured through quantitative measurements alone.

Method

This study employed a descriptive qualitative research design to explore students' perceptions and learning experiences regarding the use of Smartboard-supported learning in Islamic Religious Education. A qualitative approach was selected because the study sought to understand participants' subjective meanings, experiences, and interpretations rather than to measure relationships among variables statistically (Waruwu, 2023). This approach is particularly appropriate for investigating educational phenomena that involve complex interactions between learners, technology, and classroom contexts, allowing researchers to obtain rich and contextualized descriptions of participants' lived experiences (Creswell & Poth, 2018).

The research was conducted at SMA Negeri 1 Pariaman, West Sumatra, Indonesia, from May to June 2026. The school was purposively selected because it has implemented Smartboard technology as part of its digital learning initiative, including in Islamic Religious Education classes. This context provided an appropriate setting to investigate students' perceptions and learning experiences in technology-supported religious instruction.

Participants were selected using purposive sampling (Sugiyono, 2013) based on their direct involvement in Smartboard-supported learning. The participants consisted of ten Grade XI F2 students, one Islamic Religious Education teacher, and one vice principal for curriculum affairs. Student participants were selected based on three inclusion criteria: (1) actively participating in Smartboard-assisted IRE lessons, (2) possessing direct experience using or observing Smartboard-based learning activities, and (3) being able to communicate their learning experiences clearly during interviews. Data collection continued until the information obtained reached data saturation, indicated by the absence of substantially new themes emerging from subsequent interviews (Guest et al., 2020).

The researcher acted as the primary research instrument (human instrument), supported by observation sheets, a semi-structured interview guide, field notes, and documentation. The interview protocol was developed based on Walgito's (2010) three dimensions of perception—receiving, understanding, and evaluation—while allowing flexibility for probing

questions to capture participants' authentic learning experiences. Data were collected through classroom observations, semi-structured interviews, and document analysis, including lesson plans, learning materials, and photographs of classroom activities. Each interview lasted approximately 30–45 minutes, was audio-recorded with participants' permission, and subsequently transcribed verbatim to facilitate systematic analysis.

Data analysis followed the interactive model of Miles, Huberman, and Saldaña (2014), consisting of data condensation, data display, and conclusion drawing/verification. Interview transcripts and observation notes were read repeatedly to identify meaningful units of information, which were subsequently coded and organized into categories before being synthesized into overarching themes that represented students' perceptions and learning experiences. Throughout the analysis, the researchers continuously compared findings across different participants and data sources to strengthen analytical consistency.

To ensure the trustworthiness of the findings, several strategies were implemented. Credibility was enhanced through prolonged engagement in the research setting, triangulation of interviews, observations, and documentation, as well as member checking, whereby participants reviewed summaries of interview findings to confirm the accuracy of interpretations. Dependability and confirmability were strengthened by maintaining an audit trail documenting research decisions and analytical procedures, while transferability was supported through detailed descriptions of the research context, participants, and learning environment, enabling readers to determine the applicability of the findings to similar educational settings (Lincoln & Guba, 1985).

Ethical considerations were carefully addressed throughout the study. Prior to data collection, all participants received an explanation of the research objectives and procedures and voluntarily provided informed consent to participate. Participants were assured that their identities would remain confidential through the use of pseudonyms, that participation was entirely voluntary, and that they could withdraw from the study at any stage without any academic consequences.

Results and Discussion

Results

Students' Perceptions of Smartboard-Supported Islamic Religious Education

Students' perceptions of Smartboard-supported Islamic Religious Education were analyzed using Walgito's (2010) framework, which conceptualizes perception through three interrelated dimensions: receiving, understanding, and evaluation. Analysis of interviews with ten student participants revealed that their perceptions were predominantly positive, although several practical challenges influenced how they experienced

Smartboard-assisted learning. The findings demonstrate that students did not merely respond to the novelty of digital technology but gradually developed more critical judgments based on their actual classroom experiences.

Receiving: Initial Acceptance and Learning Attention

The first dimension concerns students' initial acceptance of Smartboard technology when it was introduced into IRE lessons. All participants described their first encounters with Smartboard as highly positive and associated the technology with increased enthusiasm toward classroom learning. Most students emphasized that the transition from conventional lecture-based instruction to multimedia-supported learning created a more enjoyable and stimulating classroom atmosphere.

For example, Gina explained that learning became considerably more attractive because the teacher was no longer "just standing in front of the class talking all the time." Likewise, Keilani described her first impression as *"fun"* because there was finally "a change in classroom activities instead of listening to lectures all the time." Similar responses were expressed by Fadil and Naura, both of whom emphasized that using Smartboard represented their first experience interacting with this type of educational technology.

The interview data further indicate that students' positive acceptance was closely associated with increased attention during classroom instruction. Several participants explained that multimedia presentations combining text, images, animation, audio, and video enabled them to maintain concentration more effectively than traditional instructional methods.

Gina, who identified herself as a visual learner, stated that audiovisual presentations helped her remain focused throughout the lesson. Similarly, Keilani reported that she previously experienced sleepiness during conventional IRE lessons but *"doesn't feel sleepy anymore"* when Smartboard is used because classroom activities become more varied and interactive.

However, students' experiences were not entirely homogeneous. Gulistan, who usually sat at the back of the classroom, reported experiencing reduced concentration because the Smartboard display was less visible from her seating position. She explained: *"I couldn't focus very well because I sat at the back, and sometimes I couldn't clearly see what was displayed."*

This finding suggests that students' initial acceptance of educational technology is influenced not only by the technological features themselves but also by physical classroom conditions that determine the accessibility of digital learning resources.

Overall, the findings indicate that the receiving dimension was characterized by high levels of curiosity, enthusiasm, and improved classroom attention. Nevertheless, classroom layout and seating arrangements emerged as contextual factors that moderated students' initial experiences with Smartboard-supported instruction.

Understanding: Enhancing Conceptual Understanding through Multimedia Learning

The second dimension examined how Smartboard influenced students' understanding of Islamic Religious Education content. Across all interviews, participants consistently perceived Smartboard as facilitating deeper conceptual understanding, particularly when learning materials involved practical procedures or abstract concepts requiring visual representation.

Several students compared Smartboard-assisted learning with conventional textbook-based instruction. Fadil explained: *"The textbook only provides the same information, but when we use the Smartboard, we can explore the material much more deeply."*

Likewise, Rafis emphasized that instructional videos displayed through the Smartboard enabled students to observe real-life applications of Islamic teachings instead of relying solely on verbal explanations.

Another important finding concerns the expansion of learning resources. Students explained that Smartboard enabled teachers to access diverse online materials, including educational videos, digital illustrations, animations, and web-based references, thereby extending learning beyond the limitations of printed textbooks.

As Yazid stated: *"With Smartboard, we can access many more references than those available in our school textbooks."*

Students further explained that multimedia presentations combining visual, textual, and auditory information helped them understand lesson content more efficiently and retain knowledge for longer periods. Rather than memorizing concepts from printed materials, they reported constructing meaning through concrete examples, visual demonstrations, and contextual illustrations presented during classroom instruction.

These findings indicate that Smartboard contributed positively to students' cognitive engagement by supporting multiple modes of information processing and enabling more contextualized learning experiences.

Evaluation: Critical Reflections on the Benefits and Limitations of Smartboard

The final dimension concerns students' evaluations after experiencing Smartboard-assisted learning over an extended period. Unlike their initial enthusiastic responses, students demonstrated more balanced and reflective judgments by identifying both the strengths and limitations of the technology.

Most participants appreciated Smartboard because it provided immediate access to various digital learning resources that enriched classroom discussions. Naura viewed Smartboard not merely as a teaching medium but also as an opportunity to improve students' digital literacy by encouraging them to search for information independently. Meanwhile, Fadil highlighted the interactive touchscreen feature, explaining that direct

interaction with digital content made classroom learning more engaging than conventional board-based instruction.

Despite these advantages, students also identified several recurring challenges. The most frequently reported problem concerned unstable internet connectivity. Intan explained: *"When the Wi-Fi is slow, a lot of class time is wasted while waiting for the videos or materials to load."*

Another concern related to prolonged exposure to digital screens, with several participants expressing worries about potential eye strain during extended classroom use.

Furthermore, students suggested that Smartboard should complement rather than replace other instructional approaches. Sittah argued: *"It should be combined with other teaching methods."*

This statement reflects students' awareness that educational technology alone cannot guarantee meaningful learning without appropriate pedagogical variation.

Taken together, students' evaluations demonstrate that they did not simply admire Smartboard because it represented a new technology. Instead, they critically assessed its educational value based on actual classroom experiences, considering both its pedagogical benefits and practical limitations. These findings indicate that students' perceptions evolved from initial curiosity toward more reflective judgments concerning the effectiveness of Smartboard-supported Islamic Religious Education.

Results 1 reveals that students' perceptions developed progressively across three dimensions. Initial acceptance was characterized by enthusiasm and increased classroom attention, understanding was strengthened through multimedia-supported conceptual learning, and evaluation reflected students' ability to critically recognize both the educational advantages and practical constraints of Smartboard implementation. Collectively, these findings suggest that students perceived Smartboard as a valuable instructional innovation, while simultaneously emphasizing the importance of effective classroom management, reliable technological infrastructure, and balanced pedagogical practices to maximize its educational benefits.

Students' Learning Experiences with Smartboard-Supported Islamic Religious Education

Beyond students' perceptions, the interviews revealed that Smartboard integration substantially influenced students' learning experiences during Islamic Religious Education. Analysis of the interview and classroom observation data identified three interconnected dimensions of learning experiences, namely affective engagement, cognitive engagement, and social participation. While most participants described Smartboard-supported learning as enjoyable and beneficial, the findings also revealed several contextual challenges that limited the quality of students' learning experiences.

Affective Learning Experiences: Increased Enjoyment, Motivation, and Classroom Engagement

The most frequently reported change concerned students' emotional responses toward classroom learning. Almost all participants explained that Smartboard transformed the classroom atmosphere from routine lecture-based instruction into a more enjoyable, interactive, and motivating learning environment.

Students consistently described themselves as becoming more enthusiastic during IRE lessons because multimedia presentations, videos, animations, and interactive activities reduced classroom monotony. Sittah explained that learning became: *"more enjoyable because we don't just listen to the teacher all the time."*

Similarly, Keilani contrasted Smartboard-supported learning with previous classroom experiences by stating: *"Without the Smartboard, the class feels flat, and it makes me sleepy."*

Several participants further reported that interactive classroom activities maintained their attention throughout the lesson, reducing boredom and increasing their willingness to participate. Classroom observations supported these interview findings, showing that students appeared more attentive during multimedia presentations and actively responded to teachers' questions following video-based learning activities.

These findings indicate that Smartboard positively influenced students' emotional engagement by creating a more stimulating learning environment that encouraged sustained attention and motivation throughout classroom instruction.

Cognitive Learning Experiences: Facilitating Understanding and Long-Term Knowledge Retention

The interview data further revealed that Smartboard enriched students' cognitive learning experiences by supporting more meaningful understanding of Islamic Religious Education concepts.

Most participants explained that learning materials presented through videos, animations, illustrations, and synchronized audio-visual explanations were considerably easier to understand than conventional textbook-based instruction. Rather than relying solely on verbal explanations, students were able to observe practical demonstrations and contextual examples that clarified abstract religious concepts.

Several students also reported that multimedia presentations enhanced memory retention because information was simultaneously received through multiple sensory channels. According to the participants, combining images, narration, videos, and teacher explanations enabled them to remember lesson content for longer periods than learning exclusively from printed materials.

Observation data further demonstrated that teachers frequently used Smartboard to display authentic videos illustrating Islamic practices before

inviting students to discuss, summarize, and reflect upon the content. This instructional sequence appeared to facilitate deeper conceptual understanding by connecting theoretical explanations with practical examples encountered in everyday life.

Consequently, students perceived Smartboard not merely as a presentation device but as a learning medium that supported conceptual comprehension, strengthened memory retention, and promoted meaningful learning experiences.

Social Learning Experiences: Encouraging Participation and Collaborative Learning

Another important finding concerns the influence of Smartboard on students' classroom participation and collaborative learning experiences.

Interview data indicate that Smartboard encouraged students to become more actively involved in classroom activities. Rather than remaining passive listeners, students participated in various collaborative learning activities, including group discussions, classroom presentations, interactive quizzes, and collaborative interpretation of instructional videos.

Rafis explained: *"Students become more active and enthusiastic."*

Similarly, classroom observations showed that after watching instructional videos, students were frequently invited to summarize the lesson, express opinions, answer questions, and discuss practical implications of Islamic teachings. These activities increased interaction not only between teachers and students but also among students themselves.

Another notable finding concerns students' changing learning habits. Participants reported that Smartboard expanded access to various digital learning resources beyond traditional textbooks. Yazid explained that students increasingly searched for additional information through YouTube, Google, and other online educational resources to complement classroom learning.

This shift indicates that Smartboard encouraged students to become more independent learners by facilitating access to multiple sources of information and supporting self-directed learning beyond classroom instruction.

Unequal Learning Experiences and Classroom Challenges

Although the majority of participants described Smartboard positively, the findings also reveal that these learning experiences were not equally experienced by all students.

Gulistan reported that classroom interaction occasionally became less conducive because some students continued talking while multimedia presentations were being displayed. She also observed that several learning sessions tended to conclude with students merely summarizing instructional videos without sufficient explanation or deeper discussion from the teacher.

Furthermore, Gulistan emphasized that sitting at the back of the classroom limited her ability to observe Smartboard presentations clearly, reducing her overall learning experience.

She explained: *"Sometimes I couldn't see the screen clearly because I sat at the back."*

These findings suggest that the educational benefits of Smartboard cannot be attributed solely to technological innovation. Instead, they remain closely dependent upon classroom management, instructional design, teacher facilitation, and physical learning conditions. In other words, technology creates opportunities for improved learning experiences, but effective pedagogical implementation ultimately determines whether these opportunities can be experienced equally by all students.

Results 2 demonstrates that Smartboard significantly reshaped students' learning experiences across affective, cognitive, and social dimensions. Students reported greater enjoyment, stronger motivation, improved conceptual understanding, enhanced memory retention, increased classroom participation, and broader access to digital learning resources. Nevertheless, the findings also indicate that these positive experiences were moderated by contextual factors such as classroom management, seating arrangements, teacher facilitation, and internet connectivity. Therefore, Smartboard should be understood not merely as a technological innovation but as a pedagogical tool whose educational value depends on how effectively it is integrated into meaningful teaching and learning practices.

Factors Influencing Students' Perceptions of Smartboard-Supported Islamic Religious Education

To understand why students developed different perceptions toward Smartboard-supported Islamic Religious Education, the findings were analyzed using the Perceiver–Target–Situation framework proposed by Robbins and Judge (2013). The analysis revealed that students' perceptions were shaped by the interaction of three interrelated factors: individual learner characteristics (perceiver), technological characteristics of the Smartboard (target), and contextual learning conditions (situation). Rather than functioning independently, these three dimensions interacted dynamically in shaping students' overall learning experiences.

Perceiver Factors: Individual Learning Preferences and Digital Readiness

The first factor influencing students' perceptions concerned individual learner characteristics. Interview data indicate that students' preferred learning styles substantially affected how they perceived the educational value of Smartboard-assisted learning.

Four participants—Gina, Gulistan, Keilani, and Aesi—identified themselves as predominantly visual learners and consistently expressed more favorable perceptions toward Smartboard integration. According to these

students, visual presentations enabled them to process information more efficiently than conventional verbal explanations.

As Gulistan explained: *"I understand things much better when they are presented visually."*

Similarly, Gina reported that audiovisual learning materials helped her maintain concentration because they matched her preferred way of learning. Other participants also indicated that videos, animations, illustrations, and interactive presentations facilitated their understanding by transforming abstract religious concepts into concrete learning experiences.

Interestingly, although students generally demonstrated positive attitudes toward Smartboard technology, the interviews suggest that these perceptions were not solely determined by the technology itself. Instead, students' previous learning experiences, individual preferences, motivation, and willingness to engage with digital learning environments also shaped how they interpreted Smartboard-supported instruction.

These findings indicate that learners are active interpreters of educational technology rather than passive recipients. Consequently, identical technological interventions may generate different learning experiences depending on students' personal characteristics and learning preferences.

Target Factors: Interactive Features and Technological Characteristics of Smartboard

The second factor relates to the characteristics of the Smartboard itself as the object of perception.

Across nearly all interviews, students consistently highlighted the Smartboard's multimedia capabilities as its most valuable characteristic. Participants appreciated the combination of educational videos, digital illustrations, animations, online learning resources, interactive quizzes, and touchscreen functionality, which collectively created a richer learning environment than conventional classroom instruction.

Rafis described this diversity of instructional resources by stating: *"There are videos, illustrations, quizzes, pictures, and many other learning materials."*

Students further explained that internet connectivity enabled teachers to access educational content directly from YouTube, Google, and various online platforms, thereby expanding learning resources beyond printed textbooks. Several participants considered this immediate access to authentic digital content one of Smartboard's greatest educational advantages.

Nevertheless, interview data also demonstrate that these technological characteristics produced both positive and negative perceptions. The most frequently mentioned limitation concerned unstable internet connectivity. Intan explained: *"When the Wi-Fi is lagging, classroom time is wasted because we have to wait for everything to load."*

Students noted that interrupted internet connections frequently delayed instructional activities, reduced classroom efficiency, and occasionally disrupted the continuity of learning.

Therefore, the characteristics of Smartboard technology simultaneously functioned as facilitators and constraints. While multimedia integration, touchscreen interaction, and internet access enriched classroom learning, technological limitations reduced students' learning satisfaction and occasionally generated frustration.

Situation Factors: School Policy, Teacher Competence, and Learning Environment

The third factor influencing students' perceptions involved the broader educational context in which Smartboard-assisted learning was implemented. Interviews with the Vice Principal for Curriculum Affairs revealed that Smartboard implementation formed part of the school's broader digital classroom initiative, which aligned with local educational policies promoting technology-enhanced learning and the development of model classrooms.

According to the Vice Principal, introducing Smartboards was intended not merely to modernize classroom facilities but also to improve instructional quality by encouraging more interactive and student-centered learning practices. Another influential situational factor concerned teachers' technological competence.

The Islamic Religious Education teacher acknowledged that integrating Smartboard into classroom instruction required continuous professional learning and adaptation. As the teacher stated: *"We have to keep learning because technology continues to develop."*

This statement illustrates that teachers viewed Smartboard implementation as an ongoing professional development process rather than a simple technological substitution. Classroom observations further confirmed that the teacher actively combined videos, PowerPoint presentations, online quizzes, digital annotations, and internet-based learning resources to support classroom instruction.

However, infrastructural limitations remained one of the most significant situational barriers identified throughout the study. Both teachers and students consistently reported unstable internet connectivity as the principal obstacle affecting Smartboard implementation. The Islamic Religious Education teacher explained that internet disruptions occasionally forced the use of personal mobile hotspots to maintain classroom activities when the school's Wi-Fi network became unstable.

This recurring issue was also observed during classroom observations, where temporary interruptions occasionally delayed instructional activities despite careful lesson preparation.

These findings indicate that the successful implementation of Smartboard-supported learning depends not only on teachers' pedagogical

competence but also on institutional support, technological infrastructure, and sustainable school policies capable of ensuring reliable access to digital learning resources.

Results 3 demonstrates that students' perceptions of Smartboard-supported Islamic Religious Education were constructed through the interaction of individual, technological, and contextual factors. Individual learning preferences shaped students' readiness to engage with multimedia learning; Smartboard's interactive features influenced students' judgments regarding instructional effectiveness; and situational factors—including school policy, teachers' digital competence, and internet infrastructure—determined the quality of technology implementation. Collectively, these findings suggest that positive student perceptions cannot be explained solely by the presence of educational technology. Instead, they emerge from the dynamic interaction between learners, technology, pedagogy, and the broader educational environment in which Smartboard-supported learning takes place.

Discussion

The findings demonstrate that students generally developed positive perceptions of Smartboard-supported Islamic Religious Education, progressing through the sequential stages of **receiving, understanding, and evaluation**, as conceptualized by Walgito (2010). Students' initial acceptance was characterized by curiosity, enthusiasm, and increased attention, which subsequently developed into deeper understanding and more critical evaluations after prolonged classroom experience. These findings support Walgito's proposition that perception is not an instantaneous response to external stimuli but a gradual cognitive process involving sensory reception, interpretation, and evaluative judgment. The positive responses observed in this study are also consistent with Mustafa et al. (2025), who reported that Interactive Flat Panels enhance students' classroom attention and participation. Furthermore, the present findings extend those reported by Aini et al. (2024) and Dewi et al. (2024), which demonstrated the effectiveness of Smartboard technology in improving learning outcomes at the elementary school level. The present study contributes additional evidence that similar educational benefits are also experienced by senior high school students within the distinctive context of Islamic Religious Education. This finding broadens the empirical scope of previous studies by demonstrating that Smartboard-supported instruction is not limited to science-oriented or primary education contexts but can also facilitate meaningful learning in value-oriented religious education.

The findings further reveal that Smartboard integration positively influenced students' affective, cognitive, and social learning experiences. Students consistently reported increased enjoyment, motivation, classroom participation, conceptual understanding, and access to diverse learning resources. These findings resonate with recent studies emphasizing that interactive educational technologies improve learning engagement by creating

multimodal learning environments that combine visual, auditory, and interactive experiences (Yaseen et al., 2025; Saleh & Mohamed, 2025). Likewise, Kasa et al. (2024) found that Interactive Flat Panels significantly improved students' learning achievement and attitudes toward classroom learning, while Jia (2025) demonstrated that interactive whiteboards promoted classroom interaction, creativity, and student participation. Rather than merely functioning as presentation tools, Smartboards in the present study enabled students to connect religious concepts with authentic situations through videos, digital illustrations, interactive quizzes, and collaborative classroom discussions. These findings indicate that meaningful learning in Islamic Religious Education can be strengthened when abstract religious concepts are presented through contextual and multimodal instructional approaches.

From a theoretical perspective, the findings also support contemporary perspectives on technology acceptance in educational settings. Although this study did not explicitly employ the Technology Acceptance Model (TAM) or the Unified Theory of Acceptance and Use of Technology (UTAUT) as its analytical framework, students' narratives clearly reflected the importance of perceived usefulness and ease of use in shaping positive attitudes toward Smartboard-assisted learning. Students appreciated Smartboard because it enabled access to richer learning resources, facilitated conceptual understanding, and increased classroom engagement. Similar conclusions have been reported by Nguyen and Nguyen (2024) and Aldiabat et al. (2024), who demonstrated that students' acceptance of educational technology depends largely on its perceived educational usefulness and learning support. Consequently, the present findings suggest that students' positive perceptions emerge not solely because Smartboard represents a new technology but because students perceive tangible educational benefits that directly enhance their learning experiences.

An equally important finding concerns the diversity of students' evaluations regarding Smartboard implementation. While most participants expressed positive perceptions, several students identified practical constraints, including unstable internet connectivity, classroom seating positions, excessive screen exposure, and the potential monotony arising from overreliance on a single instructional medium. These contrasting perspectives reinforce Robbins and Judge's (2013) Perceiver–Target–Situation framework, which argues that perception is shaped by the interaction between individual characteristics, object characteristics, and situational conditions. Students experiencing identical learning environments may therefore construct different perceptions because they differ in learning preferences, classroom positions, prior experiences, and individual expectations. This finding also complements Bergdahl et al. (2020), who argued that engagement with educational technology is influenced not only by technological availability but also by learners' individual characteristics and classroom contexts. Accordingly, Smartboard implementation should not be evaluated solely based

on technological sophistication but also on how learning environments accommodate students' diverse needs.

The findings additionally highlight the central role of teachers in maximizing the educational value of Smartboard-supported instruction. Although Smartboard provides various multimedia and interactive features, students consistently perceived meaningful learning only when teachers effectively integrated videos, discussions, quizzes, digital annotations, and reflective activities into classroom instruction. This finding confirms Mustafa et al. (2025), who emphasized that technological effectiveness depends primarily on teachers' pedagogical competence rather than technological infrastructure alone. Similarly, Rambe et al. (2024) argued that character education within the framework of Curriculum 2013 requires teachers to create meaningful learning experiences rather than merely transmitting knowledge. In this study, Smartboard became pedagogically meaningful because the teacher transformed digital content into opportunities for discussion, reflection, and contextual understanding of Islamic values. Therefore, educational technology should be viewed as a pedagogical facilitator whose effectiveness is mediated by teachers' instructional competence and creativity rather than as an autonomous determinant of learning quality.

Finally, this study contributes to the existing literature by extending the application of Walgito's theory of perception and Robbins and Judge's Perceiver–Target–Situation framework to Smartboard-supported Islamic Religious Education, an area that has received limited scholarly attention. Previous studies have predominantly examined Smartboard implementation in science, mathematics, engineering, or primary education using quantitative approaches focusing on learning outcomes or technology acceptance. In contrast, this study provides qualitative evidence regarding how senior high school students construct perceptions and learning experiences within technology-supported religious education. These findings therefore contribute both theoretically, by enriching the understanding of students' perceptions in digital religious learning environments, and practically, by providing evidence that successful Smartboard implementation requires the integration of technological infrastructure, teachers' digital pedagogical competence, and instructional strategies that actively engage students in meaningful learning experiences.

Conclusion

This study demonstrates that students generally developed positive perceptions of Smartboard-supported Islamic Religious Education through the interconnected processes of **receiving, understanding, and evaluation**, while simultaneously experiencing meaningful improvements in their affective, cognitive, and social learning experiences. More importantly, the findings reveal that the educational value of Smartboard extends beyond its role as a digital presentation tool. Instead, its effectiveness depends on the dynamic interaction among students' individual learning characteristics, the

interactive features of the technology, teachers' pedagogical competence, and the broader instructional context. These findings suggest that Smartboard-supported learning exerts a greater influence on students' engagement and learning experiences than previously assumed, particularly by facilitating contextual understanding of Islamic Religious Education through multimedia resources, collaborative learning activities, and increased access to diverse digital learning materials. At the same time, the study demonstrates that technological innovation alone cannot guarantee meaningful learning without adequate pedagogical integration and institutional support.

This study contributes to the existing literature in several ways. First, it reinforces previous evidence that interactive educational technologies positively influence student engagement, conceptual understanding, and classroom participation. Second, it challenges the common assumption that the effectiveness of Smartboard implementation is primarily determined by technological availability, demonstrating instead that teachers' pedagogical competence, students' learning characteristics, and classroom conditions collectively shape students' perceptions and learning experiences. Third, this study extends the application of Walgito's theory of perception and Robbins and Judge's Perceiver–Target–Situation framework to the context of Smartboard-supported Islamic Religious Education at the senior high school level. By integrating these theoretical perspectives with qualitative evidence, the study enriches current scholarly discussions on digital pedagogy, technology-supported religious education, and students' learning experiences within technology-enhanced classrooms.

Despite these contributions, this study has several limitations. The research was conducted within a single senior high school involving a relatively small number of participants and focused on one specific classroom context. Consequently, the findings cannot be generalized to all educational settings or Islamic Religious Education classrooms. In addition, the qualitative design emphasizes participants' subjective experiences rather than measuring the causal effects of Smartboard use on learning outcomes. Therefore, future studies should involve larger and more diverse samples across different educational contexts and regions to obtain a more comprehensive understanding of Smartboard implementation in Islamic Religious Education. Employing mixed-methods or quantitative approaches would also enable researchers to examine the relationships among students' perceptions, technology acceptance, learning engagement, and academic achievement more systematically. Furthermore, longitudinal studies are recommended to investigate whether students' positive perceptions and learning experiences remain stable after the novelty effect of Smartboard technology diminishes. Finally, from a practical perspective, schools should strengthen digital infrastructure, particularly internet reliability, while providing continuous professional development for teachers that integrates technological proficiency with pedagogical strategies capable of creating meaningful, interactive, and value-oriented Islamic Religious Education learning experiences.

References

Aildiabat, K., Gharaibeh, M. K., & Alqudah, N. F. (2024). Assessment of student satisfaction with e-learning in Jordan using TAM and UTAUT as a mediator for synchronous and asynchronous learning. *International Journal on Informatics Visualization, 8*(3), 1361–1369.

Aini, P. R., Yuliyani, Y., & Pratama, R. (2024). Penggunaan media Smartboard dalam meningkatkan pemahaman siswa pada pelajaran PAI di SD Prestige Bilingual School. *Permata: Jurnal Pendidikan Agama Islam, 5*(2), 330–340.

Alnaqeeb, R. T. A., Abdullah, N. A., & Abdullah, N. L. (2025). Towards gamified acceptance in eLearning systems: Students' perspective at Iraqi higher education institutions. *International Journal of Information and Education Technology, 15*(10), 2072–2085.

Anggun Oktavia, R. R. (2021). Peran guru pendidikan agama Islam dalam membentuk karakter peserta didik di SMP Negeri 7 Payakumbuh. *An-Nuha: Jurnal Pendidikan Islam, 1*(3), 280–290.

Barbarić Pardanjac, M., Karuović, D., & Eleven, E. (2018). The interactive whiteboard and educational software as an addition to the teaching process. *Tehnički Vjesnik, 25*(1), 255–262.

Bergdahl, N., Nouri, J., Fors, U., & Knutsson, O. (2020). Engagement, disengagement and performance when learning with technologies in upper secondary school. *Computers & Education, 149*, Article 103783.

Berger, W., Grommé, E., Stebner, F., Koch, T., Reintjes, C., & Nonte, S. (2025). Students' well-being in digital learning environments: A multilevel analysis of sixth-graders in comprehensive schools. *Education Sciences, 15*(8), Article 1034.

Bunjaku, I. B., Gagica, S., & Kent, M. D. (2024). Integrating digital tools in engineering education: Social impact of technological integration. *IFAC-PapersOnLine, 58*(3), 118–122.

Chauhan, R., & Patel, A. (2026). Assessing the impact of emerging educational technologies on student performance, retention and ethical engagement in higher education post-pandemic. *Discover Education, 5*(1), Article 391.

Chien, Y.-H. (2024). Heuristic evaluation of interactive flat panel for interactive teaching. In T. Ahram, W. Karwowski, & M. M. Soares (Eds.), *Advances in human factors and ergonomics 2024* (Vol. 156, pp. 129–134). AHFE Open.

Dewi, U. K., Subekti, E., & Rahayu, R. (2024). Efektivitas media papan pintar terhadap hasil belajar siswa kelas II sekolah dasar. *Ainara Journal (Jurnal Penelitian dan PKM Bidang Ilmu Pendidikan), 5*(4), 519–525.

Drigas, A. S., & Papanastasiou, G. (2014). Interactive white boards in preschool and primary education. *International Journal of Online Engineering, 10*(4), 46–51.

Fajriyah, E. (2022). Kemampuan literasi numerasi siswa pada pembelajaran matematika di abad 21. In *Prosiding Seminar Nasional Pendidikan* (Vol. 21, pp. 403–409).

Guest, G., Namey, E., & Chen, M. (2020). A simple method to assess and report thematic saturation in qualitative research. *PLoS ONE, 15*(5), Article e0232076.

Hou, G., & Li, G. (2026). The relationship among teacher affinity, student interest, student boredom, student digital literacy, and behavioral engagement in a smart classroom learning environment. *Psychiatry and Clinical Psychopharmacology, 36*(2), 150–161.

Jia, H. (2025). Research on the effectiveness of interactive whiteboard in art design classroom teaching. *International Journal of Web-Based Learning and Teaching Technologies, 20*(1).

Kasa, V., Satya Phani Kumari, A., & Naathi, N. B. (2024). How IFP, interactive tabs, and AI affect the achievement in rural East Godavari district secondary schools: A study. In *2024 2nd DMIHER International Conference on Artificial Intelligence in Healthcare, Education and Industry (IDICAIEI)*. IEEE.

Long, N. V. T., Lucero, J. A., & Aranas, K. R. V. (2026). Impact of digital learning platforms on student engagement and academic performance: A cross-cultural and managerial perspective. *International Journal of Special Education, 41*(8S), 605–614.

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook* (3rd ed.). SAGE Publications.

Mustafa, F. R., Harlina, Matutu, M., Khaerunnisa, & Nurhayati, L. (2025). Peran papan interaktif digital dalam meningkatkan efektivitas belajar siswa. *Jambura Elementary Education Journal, 6*, 171–182.

Nguyen, H.-H., & Nguyen, V. A. (2024). An application of model Unified Theory of Acceptance and Use of Technology (UTAUT): A use case for a system of personalized learning based on learning styles. *International Journal of Information and Education Technology, 14*(11), 1574–1582.

Mustafa, F. R., Harlina, Matutu, M., Khaerunnisa, & Nurhayati, L. (2025). Peran papan interaktif digital dalam meningkatkan efektivitas belajar siswa. *Jambura Elementary Education Journal, 6*, 171–182.

Nguyen, H.-H., & Nguyen, V. A. (2024). An application of model Unified Theory of Acceptance and Use of Technology (UTAUT): A use case for a system of personalized learning based on learning styles. *International Journal of Information and Education Technology, 14*(11), 1574–1582.

Rambe, A. A., Dwietama, R. A., Rahardja, M. N. A., Firdaus, E., Rahman, R., & Suresman, E. (2024). Implementasi pendidikan karakter dalam Kurikulum 2013. *Al-Hikmah: Jurnal Agama dan Ilmu Pengetahuan, 21*(2), 171–185.

Robbins, S. P., & Judge, T. A. (2013). *Organizational behavior* (15th ed.). Pearson.

Saleh, S., & Mohamed, T. N. (2025). Interactive tools, engaged minds: The impact of ClassPoint and EdCafe on learning strategies. *Research Journal in Advanced Humanities, 6*(2).

Sugiyono. (2013). *Metode penelitian kuantitatif, kualitatif, dan R&D*. Alfabeta.

Walgito, B. (2010). *Pengantar psikologi umum* (5th ed.). CV Andi Offset.

Wang, Z., Wan, Y., & Wei, Y. (2025). The impact of the innovation of AI education system based on the TAM and SOR theory on students' flow experience. In *Proceedings of the 2025 5th International Conference on Educational Technology (ICET 2025)* (pp. 588–592). IEEE.

Waruwu, M. (2023). Pendekatan penelitian pendidikan: Metode penelitian kualitatif, metode penelitian kuantitatif, dan metode penelitian kombinasi (*mixed methods*). *Jurnal Pendidikan Tambusai, 7*(3), 2896–2910.

Yaseen, H., Mohammad, A. S., Ashal, N., Abusaimeh, H., Ali, A., & Sharabati, A.-A. A. (2025). The impact of adaptive learning technologies, personalized feedback, and interactive AI tools on student engagement: The moderating role of digital literacy. *Sustainability, 17*(3), Article 1133.

Yunita, & Gunawan, A. S. (2024). Implementasi media pembelajaran Smartboard dalam mengembangkan literasi numerik siswa pada pembelajaran matematika di sekolah dasar. *Jurnal Pendidikan dan Pembelajaran Matematika, 29*(1), 24–33.

Zahara, A., Kusuma, A. P., Salsabil, M. D., Sumiarti, & Irfanda, H. (2026). Problematika pendidikan agama Islam di sekolah menengah: Analisis dan alternatif solusi. *AN-NAJAH: Jurnal Pendidikan Islam dan Sosial Agama, 5*(1), 490–497.