



Interactive Flat Panel Implementation in Islamic Religious Education Learning: A Case Study at SDN 1 Tugupapak

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ABSTRACT

Interactive Flat Panel (IFP) technology offers new opportunities for digital integration in Islamic Religious Education (IRE) by supporting interactive, visual learning experiences. However, limited studies have explored how IFP is implemented in elementary Islamic Religious Education classrooms and how teachers and students experience its use during learning activities. This study aims to explore the implementation of Interactive Flat Panel in Islamic Religious Education learning at SDN 1 Tugupapak. Using a qualitative case study design, the study collected data through classroom observations, interviews with the IRE teacher, students, and the school principal, and documentation. Data were analyzed through data reduction, data display, and conclusion drawing, with credibility strengthened through source and technique triangulation. The findings reveal that IFP implementation supports IRE learning by enabling multimedia-based material presentation, interactive explanations, and visual representations of religious concepts. IFP also encourages student participation, attention, and engagement during learning activities. Nevertheless, implementation challenges remain, including teachers' digital competence, technical infrastructure, and pedagogical adaptation. The study concludes that IFP's educational value depends not only on technological availability but also on teachers' ability to integrate digital tools with meaningful pedagogical practices.

Keywords: Interactive Flat Panel (IFP); Islamic Religious Education; Student Engagement; Student Understanding; Digital Learning.

1. INTRODUCTION

Advances in science and technology in the 21st century have transformed educational practices by encouraging a shift from teacher-centered instruction to more interactive, participatory, and student-centered learning environments. This transformation has shifted teachers from information transmitters to learning facilitators responsible for designing meaningful learning experiences. However, integrating technology in education should not be understood merely as using digital devices, but as a pedagogical process that requires teachers to align technological resources with learning objectives, instructional strategies, and students' needs (Hendriani et al., 2020; Mishra & Koehler, 2006).

Interactive learning approaches are particularly relevant in Islamic Religious Education (IRE), as the subject not only transmits religious knowledge but also aims to develop students' attitudes, values, and practices based on Islamic teachings. IRE encompasses various domains, including aqidah (creed), akhlaq (morality), ibadah (worship), the Qur'an, Hadith, and Islamic cultural history, which involve conceptual and normative elements requiring meaningful interpretation and contextual understanding (Nata, 2016). Therefore, IRE learning requires instructional approaches that help students connect religious concepts with concrete experiences rather than receiving information only through verbal explanations. Learning processes that predominantly rely on lectures and memorization may reduce opportunities for students to ask questions, participate in discussions, and actively engage with learning materials. These conditions reflect teacher-centered learning, in which teachers become the primary source of knowledge while students have limited opportunities to construct understanding through active participation (Jannah et al., 2025; Bonwell & Eison, 1991).



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One innovation that can support these learning needs is the use of Interactive Flat Panel (IFP). IFP is a digital learning medium that integrates screen display, computer functions, interactive whiteboard features, and touch-based technology, enabling teachers to present learning materials through various multimedia formats, including texts, images, videos, animations, quizzes, and interactive activities. The combination of visual and interactive representations can support students' understanding, particularly when learning materials involve abstract concepts that require meaningful visualization (Mayer, 2021). Furthermore, IFP provides opportunities for interaction not only between teachers and students but also between students and learning materials through direct manipulation and collaborative activities (Jumiati et al., 2025). However, the educational value of IFP does not depend solely on technological features; it also depends on teachers' ability to integrate the technology with appropriate pedagogical strategies to create meaningful learning experiences (Mishra & Koehler, 2006).

Several studies have demonstrated the potential of Interactive Flat Panel (IFP) and interactive digital media in supporting more engaging learning processes. Jumiati et al. (2025) examined the utilization of IFP as an interactive learning medium in Science and Social Studies (IPAS) learning and highlighted its role in facilitating technology-supported classroom interaction. Similarly, Sari et al. (2026) investigated the implementation of IFP or smartboard technology in elementary schools and emphasized its potential to support interactive learning activities. Beyond IFP, Riyadi and Ningsih (2024) found that Interactive Flat Panel Display (IFPD) can help students understand complex concepts through visual representation, while Hasnawiyah and Maslena (2024) and Faradita (2020) reported that interactive learning media can encourage student engagement and support learning achievement. Collectively, these studies indicate that interactive digital technologies can expand learning opportunities by facilitating visualization, interaction, and student participation. However, most existing studies have examined interactive technology in general learning contexts, while its implementation within Islamic Religious Education (IRE) learning remains less explored.

This potential is particularly relevant to Islamic Religious Education (IRE), where interactive technology can support the presentation of religious concepts through more engaging and contextual learning experiences. Ariani and Ahadiyah (2025) showed that using Interactive Flat Panel Displays in IRE learning can make material delivery more attractive and interactive. Similarly, Kurniawan and Hakim (2024) found that IFPD utilization can support student participation and understanding, while Safa'at et al. (2024) showed that digital-based interactive learning media can facilitate elementary students' conceptual understanding. These findings indicate that interactive digital technology has potential value in supporting IRE learning processes. However, existing studies have not sufficiently explained how Interactive Flat Panel is implemented in elementary-level IRE classrooms, particularly regarding teachers' utilization practices, students' learning experiences, and contextual factors influencing technology integration. Furthermore, research on interactive technology has frequently focused on general learning contexts or subjects other than IRE, leaving limited understanding of IFP implementation within elementary Islamic Religious Education, especially in rural school settings.

This research gap is particularly relevant to SDN 1 Tugupapak, Semaka District, Tanggamus Regency, where the school has provided Interactive Flat Panel (IFP) facilities as a digital learning resource. However, preliminary observations indicate that IFP utilization in Islamic Religious Education learning is still developing. In classroom practices, IFP has mainly been used to display learning materials and presentation slides. At the same time, teachers have not extensively integrated its interactive features, such as digital quizzes, simulations, and touchscreen-based collaborative activities, into learning activities. This gap between the availability of digital technology and its pedagogical use suggests that the educational value of IFP depends not only on access but also on teachers' ability to integrate it into meaningful learning processes (Mishra & Koehler, 2006).

From the perspective of Islamic education, selecting learning methods and media should consider students' characteristics, conditions, and learning needs. Islamic educational principles emphasize delivering knowledge and values wisely by considering learners' context and effective communication (Ministry of Religious Affairs of the Republic of Indonesia, 2019). Therefore, technology in Islamic

Religious Education should not be seen merely as a symbol of modernization, but as an instructional resource that supports achieving educational objectives. In this context, Interactive Flat Panel (IFP) can be understood as a pedagogical medium that helps teachers present religious learning materials more interactively, provided its use remains aligned with students' needs and meaningful learning processes.

Based on the discussion above, this study is important to explore the implementation of Interactive Flat Panel (IFP) in Islamic Religious Education learning at SDN 1 Tugupapak. Rather than measuring learning improvement, this study focuses on how IFP is integrated into the IRE learning process, how teachers use its features, how students experience technology-supported learning activities, and what factors support or hinder its implementation. The study is expected to provide empirical insights into the pedagogical utilization of interactive technology in elementary-level Islamic Religious Education learning and contribute to the development of more interactive, participatory, and contextually relevant IRE learning practices.

2. METHOD

2.1 Research Approach and Design

This study employed a qualitative approach using a case study design. The qualitative approach was selected because this research aimed to explore and understand the implementation process of Interactive Flat Panel (IFP)-based Islamic Religious Education learning within its natural educational context. Through this approach, researchers examined classroom activities, teacher practices, student responses, and contextual factors related to IFP use in learning activities. Qualitative research is appropriate when researchers seek to understand experiences, meanings, and processes within real-life settings (Creswell & Creswell, 2018).

The case study design was chosen because this research focused on an in-depth exploration of a specific phenomenon, namely the implementation of IFP-based Islamic Religious Education learning at SDN 1 Tugupapak. Case study research enables researchers to investigate contemporary educational phenomena in real-world contexts and gain a comprehensive understanding of how technology is integrated into learning practices (Yin, 2018). Therefore, this design was considered suitable for examining the process of IFP utilization, students' learning experiences, and factors influencing its implementation.

2.2 Research Location and Participants

The research was conducted at SDN 1 Tugupapak, Semaka District, Tanggamus Regency. The school was selected as the research location because it has implemented Interactive Flat Panel (IFP) technology as a digital learning facility. However, the utilization of IFP, particularly in Islamic Religious Education learning, continues to develop as teachers adapt the technology to classroom needs and instructional practices.

The research participants consisted of Islamic Religious Education teachers, students, and the school principal. The researchers purposively selected these participants because they had direct experience and relevant information about IFP implementation in the learning process. The Islamic Religious Education teacher provided information on instructional planning, classroom implementation strategies, and challenges in using IFP. Students provided perspectives regarding their learning experiences, participation, and understanding during IFP-supported learning activities. Meanwhile, the school principal provided information related to school policies, infrastructure support, and institutional efforts in implementing digital learning. Purposive sampling is commonly used in qualitative research to identify participants with relevant knowledge and experience related to the phenomenon being studied (Creswell & Creswell, 2018).

These participants were selected because they have direct knowledge and experience implementing IFP in the learning process. The Islamic Religious Education teacher provided information regarding instructional planning, implementation strategies, and challenges in utilizing IFP. Students provided perspectives regarding their learning experiences, engagement, and understanding when participating in IFP-based learning activities. Meanwhile, the school principal provided information on school policies, facilities, and institutional support for implementing digital learning.

2.3 Data Sources and Data Collection Techniques

This study used primary and secondary data. The researchers obtained primary data directly from research participants through classroom observations and semi-structured interviews. These data included information on the implementation process of IFP-based Islamic Religious Education learning, teacher strategies for using digital media, student participation, and students' perceptions of technology-supported learning activities.

Secondary data were obtained from supporting documents related to the research topic, including lesson plans, learning materials, documentation of IFP utilization, photographs of learning activities, and relevant school documents.

Data collection used observation, interviews, and documentation. These techniques were selected because they allow researchers to obtain comprehensive information by examining learning practices, participants' experiences, and supporting evidence from multiple sources (Moleong, 2019).

2.4 Data Analysis

The collected data were analyzed using the interactive data analysis model consisting of three stages: data condensation, data display, and conclusion drawing and verification. This model emphasizes the continuous interaction between data collection and analysis throughout the research process (Miles et al., 2014).

Data condensation involved selecting, simplifying, and organizing relevant information obtained from observations, interviews, and documentation. At this stage, researchers identified patterns related to IFP implementation, student engagement, learning experiences, and supporting and inhibiting factors.

Data display involved presenting organized information through descriptions, categories, and relationships among findings. The final stage involved drawing conclusions and verifying interpretations by continuously comparing evidence from different data sources.

Data Validity

To ensure data credibility, this study applied triangulation techniques. The study conducted source triangulation by comparing information from different participants, including teachers, students, and the school principal. The study used technique triangulation by comparing findings from observations, interviews, and documentation. In addition, the researcher conducted member checking by confirming interpretations with relevant participants to ensure the findings accurately represented their experiences and perspectives. These procedures strengthened the credibility and trustworthiness of the qualitative findings (Lincoln & Guba, 1985).

3. RESULTS AND DISCUSSION

3.1 Implementation of Interactive Flat Panel (IFP)-Based Islamic Religious Education Learning

The findings indicate that implementing Interactive Flat Panel (IFP)-based Islamic Religious Education (IRE) learning at SDN 1 Tugupapak supports the development of a more interactive learning environment. Based on classroom observations and interviews, IFP utilization has encouraged the integration of digital technology, multimedia resources, and interactive activities into the learning process. Rather than replacing teachers' roles, IFP functions as a supporting medium that enables teachers to present learning materials in more varied formats and facilitate interaction between students and learning content. This finding aligns with perspectives on technology integration, which emphasize that the value of educational technology depends on how teachers combine technological resources with pedagogical strategies and learning objectives (Mishra & Koehler, 2006).

In implementation, teachers use IFP to present learning materials in various formats, including texts, images, videos, and interactive exercises. These features enable teachers to deliver Islamic Religious Education materials through multiple representations, allowing students to encounter learning content in more visual and contextual forms. This is particularly relevant in IRE learning, where several concepts related to faith, morality, worship, and Islamic history require meaningful explanation and contextual examples. Multimedia representations can support students' understanding by combining verbal information and visual elements, helping learners process and organize knowledge more effectively (Mayer, 2021).

IFPs also give students opportunities to interact directly with learning materials. Through touchscreen features and interactive activities, students are positioned not only as recipients of information but also as participants who engage with learning content. This supports student-centered learning practices, where

students have more opportunities to respond, explore, and participate in classroom activities. These learning processes align with active learning principles, which emphasize student involvement in constructing knowledge through interaction and participation (Bonwell & Eison, 1991; Prince, 2004).

Implementing IFP in IRE learning also requires teachers to design learning activities carefully. The findings indicate that the effectiveness of IFP utilization does not depend solely on technological availability, but also on teachers' ability to integrate technological features with appropriate pedagogical strategies. Therefore, IFP functions optimally when teachers use it as an interactive learning medium that supports exploration, discussion, and student participation rather than merely as a replacement for conventional presentation tools. This finding reinforces the view that successful technology integration requires aligning technological knowledge, pedagogical knowledge, and content knowledge (Mishra & Koehler, 2006).

3.2 The Role of IFP in Increasing Student Engagement

The findings reveal that IFP supports students' engagement during the Islamic Religious Education learning process. Based on classroom observations, IFP's interactive features encouraged students to participate in learning activities through discussions, responses, demonstrations, and direct interaction with digital learning materials. Interactive technology created opportunities for students to become more actively involved in classroom activities rather than only receiving information from the teacher. This finding indicates that IFP functions as a learning medium that facilitates classroom interaction and participation.

Compared with learning activities that rely primarily on verbal explanation and textbooks, multimedia elements such as videos, animations, and interactive exercises provide students with more varied learning experiences. These features help attract students' attention and stimulate curiosity toward the learning materials presented. The findings reflect aspects of student engagement, particularly behavioral and emotional engagement, as students demonstrate greater willingness to participate, respond, and interact during learning activities (Fredricks et al., 2004).

Student engagement in IFP-supported learning was reflected through several observable indicators, including students' willingness to answer questions, participate in classroom activities, express opinions, and interact with digital learning content. Interactive technology contributed to a more dynamic classroom atmosphere by giving students more opportunities to respond and participate during learning activities. These findings align with active learning perspectives, which emphasize that meaningful learning occurs when students actively construct knowledge (Bonwell & Eison, 1991; Prince, 2004).

However, the findings also indicate that IFP's contribution to student engagement depends on how teachers design and manage classroom activities. If IFP is only used for displaying slides or delivering information, its interactive potential cannot be fully utilized. Therefore, teachers need to design learning activities that encourage students to explore, respond, discuss, and collaborate through the available digital features. This finding reinforces the importance of teachers' technological pedagogical knowledge, where technology becomes meaningful when integrated with appropriate instructional strategies and learning objectives (Mishra & Koehler, 2006).

3.3 The Role of IFP in Improving Student Understanding

Using IFP supports students' understanding of Islamic Religious Education materials by giving them opportunities to access content through multiple forms of representation. Integrating visual, audio, and interactive elements enables students to process information through different learning channels, which may support deeper comprehension. This finding aligns with the multimedia learning perspective, which explains that students develop a better understanding when learning materials present meaningful combinations of verbal and visual information (Mayer, 2021).

Islamic Religious Education materials often include concepts related to faith (aqidah), morality (akhlaq), worship (ibadah), and Islamic history, which require contextual explanations to support students' understanding. At the elementary school level, several religious concepts may be difficult for students to understand when delivered only through verbal explanations. Through IFP, teachers can use illustrations, videos, and contextual examples to make abstract concepts more concrete. Visual representation is particularly relevant for supporting learners' comprehension because it allows students to connect conceptual knowledge with observable examples (Mayer, 2021).

The findings show that students found it easier to understand learning materials when multimedia presentations supported the explanations. Classroom observations showed that visual representations helped students connect religious concepts with concrete examples, while interactive activities provided opportunities to respond to questions, discuss ideas, and reinforce their understanding. These findings suggest that IFP functions not only as a presentation tool but also as a learning environment that facilitates students' active engagement with educational content.

Nevertheless, students' understanding through IFP-supported learning depends on appropriate instructional design. Technology alone does not automatically produce meaningful learning outcomes; rather, learning benefits emerge when digital tools are integrated with effective pedagogical approaches and aligned with students' learning needs. Therefore, teachers play an important role in turning IFP features into meaningful learning activities by integrating technological knowledge, pedagogical strategies, and subject content (Mishra & Koehler, 2006).

3.4 Supporting and Inhibiting Factors in the Implementation of Interactive Flat Panel (IFP)

Various supporting and inhibiting factors influence the implementation of Interactive Flat Panel (IFP)-based Islamic Religious Education learning at SDN 1 Tugupapak. The findings indicate that successful technology integration depends not only on the availability of digital devices but also on institutional support, teacher competence, learning resources, and infrastructure readiness. These factors shape how IFP can be integrated meaningfully into classroom practices and transformed from a technological facility into a pedagogical resource (Mishra & Koehler, 2006).

One of the main supporting factors identified in this study is the availability of technological facilities provided by the school. The presence of IFP as a learning resource creates opportunities for teachers to develop more varied instructional strategies by utilizing multimedia and interactive features. In addition, institutional support through policies that encourage digital learning implementation helps create an environment that facilitates technology adoption. However, infrastructure availability is only an initial condition; meaningful technology integration depends on how resources are used within pedagogical practices (Mishra & Koehler, 2006).

Teacher competence emerged as another important supporting factor in IFP implementation. Teachers with sufficient digital literacy and pedagogical understanding can better use IFP features to design learning activities that encourage student participation and interaction. The findings indicate that IFP effectiveness depends on teachers' ability to combine technological features with appropriate instructional approaches, rather than simply operating the device. This condition reflects the importance of technological pedagogical content knowledge (TPACK), in which teachers integrate technology, pedagogy, and subject content to create meaningful learning experiences (Mishra & Koehler, 2006).

Furthermore, students' positive responses toward digital-based learning also support the implementation of IFP. Students demonstrated greater interest and enthusiasm when learning materials were presented through multimedia resources and interactive activities. These responses indicate that digital learning environments can provide additional opportunities for students to participate actively and engage with learning content. However, student responses alone are not sufficient to ensure successful implementation, as meaningful engagement remains dependent on how teachers design and facilitate learning activities.

Despite these supporting factors, several challenges remain in implementing IFP. One main obstacle identified is teachers' limited digital-pedagogical competence. Although teachers may already be familiar with basic technology operations, integrating IFP features into meaningful instructional activities requires more advanced skills related to digital content development, interactive learning design, and technology-supported pedagogy. Therefore, continuous professional development is necessary to strengthen teachers' capacity in utilizing IFP effectively.

Another challenge concerns the availability of interactive learning materials specifically designed for IFP utilization. The findings indicate that technological infrastructure alone is insufficient if teachers lack appropriate digital learning resources that support interactive activities. The effectiveness of IFP depends not only on hardware availability but also on the quality, relevance, and suitability of digital content used during instruction.

Infrastructure readiness also remains an important consideration in sustaining IFP implementation. Technical problems, device maintenance, and internet accessibility may influence the continuity of technology-supported learning activities. Therefore, sustainable institutional support, teacher training

programs, and infrastructure improvements are required to ensure that IFP functions effectively as a pedagogical medium rather than merely a technological facility.

4. CONCLUSION

This study concludes that implementing Interactive Flat Panel (IFP) in Islamic Religious Education learning at SDN 1 Tugupapak provides opportunities to develop a more interactive, visual, and participatory learning environment. Teachers use IFP to present learning materials through multimedia resources, including texts, images, videos, and interactive activities, which support delivering Islamic Religious Education concepts in more contextual ways.

The findings indicate that IFP supports student engagement by creating opportunities for students to participate in discussions, respond to learning materials, and interact directly with digital content. In addition, integrating visual and interactive elements helps students understand Islamic Religious Education materials by connecting abstract concepts with more concrete representations. However, these benefits depend on teachers' ability to integrate technological features with appropriate pedagogical strategies.

Several supporting and inhibiting factors influence IFP implementation. School facilities, institutional support, teacher competence, and students' positive responses become important supporting elements. At the same time, challenges remain related to teachers' digital-pedagogical competence, availability of interactive learning materials, and infrastructure readiness. These findings demonstrate that successful technology integration requires more than the availability of digital devices; it requires meaningful pedagogical utilization within the learning process.

This study contributes to the discussion of digital technology integration in Islamic Religious Education by highlighting the importance of viewing IFP not merely as a technological facility but as a pedagogical resource. Future studies may examine IFP implementation across different educational contexts using broader participant groups or comparative research designs to deepen understanding of technology-supported Islamic Religious Education learning.

DECLARATIONS

Author Contributions

Conceptualization: A.A.; methodology: A.A. and collaborators; data collection: A.A.; data analysis: A.A.; writing original draft preparation: A.A.; writing review and editing: all authors.

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Conflict of Interest

The authors declare no conflict of interest.

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Ethics Approval

This study followed ethical principles for educational research. The relevant educational institution granted permission, and the research team carried out the study while maintaining participants' confidentiality and respecting their rights throughout data collection and reporting.

Data Availability

The data supporting the findings of this study are available from the corresponding Author upon reasonable request.

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