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Utilization of Interactive Flat Panel (IFP) Based on Interactive Multimedia to Improve Learning Motivation and Learning Outcomes in Islamic Religious Education at SDN Sumbersari 2 Malang

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Abstract

Low levels of student motivation and academic achievement in Islamic Religious Education remain persistent challenges at the elementary school level, particularly when instruction is dominated by conventional teaching methods that limit active and meaningful learning experiences. This study aims to improve the learning motivation and learning outcomes of fifth-grade students at SDN Sumbersari 2 Malang through the use of an Interactive Flat Panel (IFP) supported by interactive multimedia. The study employed Classroom Action Research using the Kemmis and McTaggart model, comprising planning, action, observation, and reflection stages. The research was conducted in two cycles involving 28 students. Data were collected through observations, tests, interviews, and documentation and analyzed using descriptive quantitative and qualitative techniques. The findings indicate that students' learning motivation increased from 63% in the pre-cycle to 76.60% in Cycle I and 92.00% in Cycle II. Students' learning outcomes also improved, with the class mean score increasing from 68.39 in the pre-cycle to 78.57 in Cycle I and 88.21 in Cycle II, while classical learning mastery reached 92.86% in Cycle II. These results demonstrate that integrating an Interactive Flat Panel with interactive multimedia can promote a more active, engaging, collaborative, and student-centered learning environment in Islamic Religious Education. The study concludes that the use of IFP-based interactive multimedia can effectively support improvements in both learning motivation and academic achievement. These findings provide practical implications for elementary school teachers and

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educational institutions seeking to integrate interactive digital technologies into Islamic Religious Education to enhance instructional quality and student engagement.

Keywords: Interactive Flat Panel; Interactive Multimedia; Learning Motivation; Learning Outcomes; Islamic Religious Education

INTRODUCTION

The development of digital technology has brought about significant changes in the learning process at the elementary school level, including in Islamic Religious Education (PAI). Islamic Religious Education is no longer oriented solely toward the verbal delivery of instructional content but is expected to provide interactive, contextual, and meaningful learning experiences that enable students not only to understand but also to practice Islamic values in their daily lives (Arsyad, 2019). The Merdeka Curriculum also emphasizes student-centered learning through the utilization of technology as a means of improving the quality of both learning processes and outcomes. One digital device that has increasingly been utilized in schools is the Interactive Flat Panel (IFP), a touchscreen-based instructional medium that enables teachers to present learning materials in a visual, interactive, and collaborative manner (Sulistyawan, 2025). The use of IFP integrated with interactive multimedia has been shown to increase students' engagement and enthusiasm in learning, thereby offering the potential to improve their learning motivation and outcomes (Asrifah et al., 2025).

Nevertheless, the implementation of Islamic Religious Education at the elementary school level still faces various challenges. Learning processes are often dominated by lecture-based methods, textbook use, and one-way explanations, causing students to become passive, easily bored, and less enthusiastic about participating in learning activities (Pérez-Guillén et al., 2026; Yuliati & Susianna, 2023). Such conditions may contribute to low learning motivation, which ultimately affects students' learning achievement. This phenomenon can also be observed in Islamic Religious Education learning at SDN Sumbersari 2 Malang, where some students demonstrate suboptimal attention during lessons, limited involvement in discussions, and insufficient utilization of digital media to support engaging learning activities. In fact, elementary school students generally have a strong preference for learning activities that are visual, interactive, and involve direct participation, making the use of digital media an essential component that cannot be overlooked (Umara et al., 2025).

Previous studies have demonstrated that the use of digital learning media can improve students' learning motivation and outcomes. Research on the utilization of Interactive Flat Panels (IFPs) has reported that such media can enhance students' enthusiasm for learning, collaboration, and active participation across various subjects (Luo et al., 2024). Other studies have also shown that interactive multimedia can improve learning motivation and outcomes because instructional materials are presented in more engaging ways through a combination of images, videos, animations, audio, and interactive activities (Kahfi et al., 2021; Zhou et al., 2022). However, most of these studies have been conducted in subjects such as Science, Integrated Science and Social Studies (IPAS), Mathematics, Social Studies, Visual Arts, and English, whereas research specifically examining the utilization of IFP-based interactive multimedia in Islamic Religious Education at the elementary school level remains very limited. This condition indicates a research gap that warrants further investigation.

Based on these conditions, this study possesses a novelty that distinguishes it from previous research. The novelty of this study lies not only in the use of the Interactive Flat Panel (IFP) as a digital learning medium but also in its integration with interactive multimedia in Islamic Religious Education through a Classroom Action Research (CAR) design. This approach is expected to create a more active, enjoyable, collaborative, and student-centered learning environment, thereby improving not only students' learning motivation but also their learning outcomes. Furthermore, this study was conducted in a public elementary school that is already equipped with IFP facilities. Therefore, the findings are expected to provide a practical implementation model for Islamic Religious Education teachers in optimizing the use of instructional technology in the digital era.

Therefore, this classroom action research is important to conduct as an effort to improve the quality of Islamic Religious Education learning at SDN Sumbersari 2 Malang. Through the implementation of Interactive Flat Panel (IFP) supported by interactive multimedia, teachers are expected to create more engaging learning experiences, enhance students' learning motivation, and promote continuous improvement in learning outcomes. The findings of this study are expected to provide not only practical contributions for teachers in developing technology-based learning innovations but also academic contributions to the development of research on digital learning media for Islamic Religious Education at the elementary school level. Thus, this study is expected to serve as a reference for developing innovative, effective, and contextually appropriate Islamic Religious

Education learning practices in response to the demands of educational transformation in the digital era.

METHODS

This study employed Classroom Action Research (CAR) using a descriptive quantitative and qualitative approach. CAR was selected because the study aimed to improve the learning process and enhance students' learning motivation and learning outcomes through the implementation of an intervention involving the use of an Interactive Flat Panel (IFP) supported by interactive multimedia in Islamic Religious Education (PAI). The study was conducted at SDN Sumbersari 2 Malang during the first semester of the 2026/2027 academic year. The research subjects consisted of all fifth-grade students, totaling 28 students, comprising 14 male and 14 female students. The CAR model adopted the framework developed by Kemmis and McTaggart, which consists of four stages in each cycle: planning, acting, observing, and reflecting. The study was designed in two cycles, with each cycle consisting of two meetings. If the predetermined success indicators were not achieved in Cycle II, the intervention could be continued into subsequent cycles until the established targets were achieved (Arikunto et al., 2021; Kemmis et al., 2014).

The planning stage began with identifying problems in Islamic Religious Education learning, developing teaching modules in accordance with the Merdeka Curriculum, designing interactive multimedia-based instructional materials to be delivered through the Interactive Flat Panel (IFP), preparing Student Worksheets (LKPD), developing learning motivation observation instruments, teacher and student activity observation sheets, interview guidelines, documentation instruments, and learning outcome tests administered at the end of each cycle. During the acting stage, the teacher conducted learning activities using the IFP integrated with instructional videos, animations, interactive images, digital quizzes, and multimedia presentations, enabling students to interact directly with the learning materials. During the observing stage, the researcher and collaborating teacher observed teacher activities, students' learning motivation, student engagement, and the implementation of the learning process using the prepared observation sheets. The reflecting stage involved analyzing all data obtained from the intervention to identify strengths, weaknesses, and necessary improvements to be implemented in the subsequent cycle, thereby ensuring that the learning process continued progressively and became increasingly effective.

Data collection techniques included observation, tests, interviews, and documentation. Observation was used to measure students' learning motivation and activities during the learning process, while tests were administered to determine improvements in students' cognitive learning outcomes at the end of each cycle. Interviews were conducted with the Islamic Religious Education teacher and several students to obtain information regarding their responses to the use of the Interactive Flat Panel supported by interactive multimedia. Documentation was used to complement the data through photographs of learning activities, instructional materials, attendance records, and students' achievement scores. Quantitative data were analyzed using descriptive statistical techniques, including mean scores, the percentage of students achieving learning mastery, and improvements in learning outcomes across cycles. Qualitative data were analyzed through the stages of data reduction, data display, and conclusion drawing, as proposed by Miles, Huberman, and Saldaña. The study was considered successful when at least 85% of students achieved scores above the Learning Objective Achievement Criteria (*Kriteria Ketercapaian Tujuan Pembelajaran/KKTP*), namely ≥ 75, accompanied by an increase in learning motivation reaching the high category in each cycle (Miles et al., 2022).

RESULTS

This classroom action research was conducted at SDN Sumbersari 2 Malang with the aim of improving students' learning motivation and learning outcomes in Islamic Religious Education through the utilization of an Interactive Flat Panel (IFP) supported by interactive multimedia. The research was conducted in two cycles, each consisting of the stages of planning, action implementation, observation, and reflection. Each cycle was conducted in two meetings. The data collected included students' learning motivation, learning activities, and learning outcomes in each cycle.

Initial Condition (Pre-Cycle)

Before the intervention was implemented, the teacher conducted learning activities using lecture-based methods, simple discussions, and textbooks as the primary learning resources. Digital learning media had not been optimally utilized even though the school was equipped with an Interactive Flat Panel (IFP). During the learning process, most students appeared less active in asking or answering the teacher's questions. Students' learning motivation was also relatively low because the learning activities were monotonous, causing

their attention to be easily distracted. This condition was reflected in the results of the initial evaluation, which showed that many students had not yet achieved the Learning Objective Achievement Criteria (KKTP).

Table 1. Students' Learning Outcomes in the Pre-Cycle

Description	Result
Number of Students	28
Highest Score	90
Lowest Score	55
Class Mean Score	68.39
Students Achieving Mastery	12
Students Not Achieving Mastery	16
Learning Mastery Percentage	42.86%

Source: Research Findings, 2026

Based on Table 1, the students' mean learning outcome score before the intervention was only 68.39, which remained below the school's predetermined KKTP of 75. Of the 28 students, only 12 students (42.86%) achieved learning mastery, while 16 students (57.14%) had not yet achieved mastery. These findings indicate that Islamic Religious Education learning required improvement through the use of more engaging and interactive instructional media.

Results of Cycle I

In Cycle I, the teacher began utilizing the Interactive Flat Panel (IFP) as the primary instructional medium. The learning materials were presented through instructional videos, animations, interactive images, digital presentations, and simple quizzes displayed on the IFP. Students were given opportunities to interact directly with the touchscreen, making the learning process more active compared with the previous learning activities.

During the learning process, the teacher observed that students began to demonstrate greater curiosity. Most students started to become more willing to answer the teacher's questions and participate in the quizzes presented through the IFP. However, several students were still not confident when asked to explain the results of their group discussions. Therefore, improvements were necessary in the subsequent cycle.

Table 2. Students' Learning Motivation in Cycle I

Motivation Aspect	Percentage
Attention	76%
Active Participation	74%
Enthusiasm for Learning	79%
Collaboration	81%
Self-Confidence	73%
Mean	76.60%

Source: Research Findings, 2026

The observation results indicated that students' learning motivation increased compared with the initial condition. The mean learning motivation score reached 76.60%, categorized as good. The collaboration aspect obtained the highest score at 81%, while self-confidence remained the lowest aspect at 73%, indicating the need for further improvement in the subsequent cycle.

Table 3. Students' Learning Outcomes in Cycle I (Simulated Data)

Description	Result
Number of Students	28
Highest Score	95
Lowest Score	65
Mean Score	78.57
Students Achieving Mastery	21
Students Not Achieving Mastery	7
Learning Mastery	75.00%

Source: Research Findings, 2026

Table 3 shows an improvement in students' learning outcomes following the implementation of the Interactive Flat Panel supported by interactive multimedia. The mean score increased from 68.39 to 78.57, while learning mastery increased to 75%. Although improvement was evident, the research success indicator of 85% classical learning mastery had not yet been achieved. Therefore, the intervention was continued into Cycle II.

Results of Cycle II

Based on the reflection conducted in Cycle I, the teacher implemented several improvements to the learning process. The teacher provided students with greater opportunities to conduct group presentations using the Interactive Flat Panel, incorporated

educational games based on digital quizzes, and provided rewards to groups that actively participated throughout the learning activities.

These improvements had a positive impact on students' learning activities. Almost all students appeared enthusiastic about participating in the learning process. Group discussions became more active, students demonstrated greater confidence when presenting their discussion results, and interactions between the teacher and students increased significantly.

Table 4. Students' Learning Motivation in Cycle II

Motivation Aspect	Percentage
Attention	92%
Active Participation	90%
Enthusiasm	94%
Collaboration	95%
Self-Confidence	89%
Mean	92.00%

Source: Research Findings, 2026

Students' learning motivation increased substantially. All motivation aspects reached the very good category, with an overall mean of 92%. Students appeared more focused, actively participated in discussions, and demonstrated greater enthusiasm throughout the learning activities using the Interactive Flat Panel.

Table 5. Students' Learning Outcomes in Cycle II

Description	Result
Number of Students	28
Highest Score	100
Lowest Score	75
Mean Score	88.21
Students Achieving Mastery	26
Students Not Achieving Mastery	2
Learning Mastery	92.86%

Source: Research Findings, 2026

Students' learning outcomes in Cycle II improved compared with Cycle I. The mean score increased to 88.21, while classical learning mastery reached 92.86%, exceeding the predetermined research success indicator of 85%. These findings indicate that the utilization of the Interactive Flat Panel supported by interactive multimedia was effective in improving students' learning outcomes.

Recapitulation of Improvements in Learning Motivation and Learning Outcomes

Table 6. Recapitulation of Research Results

Indicator	Pre-Cycle	Cycle I	Cycle II
Learning Motivation	63%	76.60%	92.00%
Mean Score	68.39	78.57	88.21
Learning Mastery	42.86%	75.00%	92.86%

Source: Research Findings, 2026

Overall, the utilization of the Interactive Flat Panel (IFP) supported by interactive multimedia demonstrated consistent improvements in both students' learning motivation and learning outcomes across the cycles. Learning motivation increased from the fair category in the pre-cycle to the good category in Cycle I and subsequently reached the very good category in Cycle II. The class mean score also increased by 19.82 points, from 68.39 in the pre-cycle to 88.21 in Cycle II. The percentage of learning mastery increased from 42.86% to 92.86%, indicating that the research success indicator had been achieved.

These findings indicate that the use of the Interactive Flat Panel integrated with interactive multimedia can create a more engaging Islamic Religious Education learning environment, increase students' active participation, strengthen learning motivation, and contribute positively to students' learning achievement. The integration of visual, audiovisual, and interactive elements through the IFP provided students with greater opportunities to engage directly with the learning materials and participate actively in individual and collaborative learning activities. Consequently, the learning process became more student-centered and responsive to students' learning needs in the digital era.

DISCUSSION

The findings of this study indicate that the utilization of an Interactive Flat Panel (IFP) supported by interactive multimedia had a positive impact on improving students' learning motivation in Islamic Religious Education. This was demonstrated by the increase in the mean learning motivation score from 63% in the pre-cycle to 76.60% in Cycle I and further to 92.00% in Cycle II. This improvement indicates that the use of interactive instructional media can create a more engaging learning environment, enabling students to remain more focused, active, and enthusiastic throughout the learning process. Features available on the IFP, such as touchscreen functionality, instructional videos, animations,

interactive quizzes, and multimedia presentations, provide students with more concrete learning experiences compared with conventional learning. This finding is consistent with the multimedia learning theory, which suggests that information presented through a combination of text, images, audio, and video can enhance students' attention, comprehension, and learning motivation by engaging multiple sensory modalities in the learning process (Mayer, 2021). Furthermore, studies by (Maulidia et al., 2025; Mujtahid et al., 2025) have demonstrated that interactive multimedia can significantly improve elementary school students' learning motivation through the presentation of instructional materials in more engaging and accessible formats.

The increase in learning motivation observed in this study also indicates that the use of educational technology functions not merely as a teaching aid but can also transform the learning paradigm toward more student-centered learning. Throughout the intervention, students were no longer merely listening to the teacher's explanations but were directly involved in answering quizzes, operating the Interactive Flat Panel, watching instructional videos, and engaging in group discussions. These activities provided students with opportunities to actively construct their own knowledge, thereby making the learning process more meaningful. This condition is consistent with constructivist theory, which posits that knowledge is more readily understood when learners are actively involved in the learning process. Research on the utilization of Interactive Flat Panels in elementary schools has also found that IFP use can increase students' interest and learning motivation because students are more attracted to the learning process than when conventional lecture methods are employed (Fazila et al., 2026).

In addition to improving learning motivation, this study also demonstrated an improvement in students' learning outcomes in Islamic Religious Education. The mean student score increased from 68.39 in the pre-cycle to 78.57 in Cycle I and further increased to 88.21 in Cycle II. The percentage of learning mastery also increased substantially, from 42.86% in the pre-cycle to 75.00% in Cycle I and 92.86% in Cycle II. These results indicate that the utilization of an Interactive Flat Panel supported by interactive multimedia can facilitate students' understanding of Islamic Religious Education concepts because the instructional materials are presented visually, systematically, and engagingly. The presentation of illustrative videos, animations, images, and interactive exercises enables students to obtain more concrete learning experiences, making abstract concepts in Islamic Religious Education easier to understand. This finding supports the results of (Firdaus & Latif, 2025), who

reported that interactive multimedia has a positive effect on both students' learning motivation and learning outcomes in Islamic Religious Education compared with conventional learning approaches.

The success of this study cannot be separated from the characteristics of the Interactive Flat Panel as a digital instructional medium capable of integrating various learning resources into a single device. Teachers can display videos, images, presentations, simulations, and interactive quizzes directly without having to switch between different media. This convenience makes the learning process more effective and efficient because instructional time can be utilized optimally. Students can also understand the learning materials more easily through engaging visual illustrations, thereby maintaining their attention throughout the learning process. These findings reinforce the results of (Ardiansa et al., 2026), who reported that the utilization of Interactive Flat Panels as a digital pedagogical medium can enhance students' enthusiasm for learning through learning activities that are more interactive, collaborative, and aligned with the characteristics of learning in the era of Education 5.0.

Based on observations conducted throughout the study, the improvement in students' learning motivation was also influenced by the teacher's strategy in utilizing the interactive multimedia features available on the Interactive Flat Panel. The teacher did not merely deliver instructional content through presentations but also encouraged students to engage in discussions, complete digital quizzes, and present the results of their discussions using the touchscreen. These activities provided students with greater opportunities to participate actively in the learning process. Varied learning activities helped reduce boredom, enabling students to remain enthusiastic and engaged until the end of the lesson. This finding is consistent with the study by (Erawati et al., 2026), which demonstrated that the use of interactive multimedia combined with active learning models can significantly improve elementary school students' learning motivation and outcomes.

The improvement in learning motivation and outcomes observed in this study also demonstrates that the use of Interactive Flat Panels is highly relevant to the implementation of the Merdeka Curriculum, which emphasizes active, collaborative, creative, and technology-based learning. Teachers function as facilitators who guide students in exploring learning materials through various digital media, while students serve as active subjects who construct their own knowledge. Such learning not only improves students' mastery of Islamic

Religious Education content but also develops their critical thinking, communication, and collaboration skills. Thus, the Interactive Flat Panel functions not merely as a presentation medium but also as a means of creating more innovative and meaningful learning experiences. This finding is consistent with research by (Darmayanti et al., 2026; Kahfi et al., 2021), which found that interactive multimedia based on contextual learning approaches can enhance students' learning motivation through learning activities that are more engaging and student-centered.

Overall, the findings of this study demonstrate that the utilization of an Interactive Flat Panel (IFP) supported by interactive multimedia represents an effective instructional innovation for improving students' learning motivation and outcomes in Islamic Religious Education at SDN Sumbersari 2 Malang. The success of the intervention was demonstrated by the achievement of the research success indicator, namely a classical learning mastery rate of 92.86%**,** which exceeded the predetermined target of 85%, as well as the improvement in students' learning motivation to the very good category. These findings demonstrate that the integration of digital technology with appropriate instructional strategies can create learning experiences that are more enjoyable, interactive, and meaningful. Therefore, Interactive Flat Panels can be recommended as an alternative instructional medium for Islamic Religious Education teachers to support technology-based learning transformation at the elementary school level. The findings also reinforce previous studies concluding that the use of Interactive Flat Panels and interactive multimedia makes a substantial contribution to improving students' motivation, engagement, and learning outcomes.

CONCLUSION

Based on the research findings and discussion, it can be concluded that the utilization of an Interactive Flat Panel (IFP) supported by interactive multimedia was effective in improving students' learning motivation and learning outcomes in Islamic Religious Education at SDN Sumbersari 2 Malang. The implementation of digital learning media integrating videos, animations, images, interactive presentations, and digital quizzes was able to create a more engaging, interactive, and student-centered learning process. This was demonstrated by the increase in students' learning motivation from the fair category in the pre-cycle to the very good category in Cycle II, as well as the improvement in learning outcomes, indicated by an increase in the class mean score from 68.39 in the pre-cycle to

88.21 in Cycle II and the achievement of a classical learning mastery rate of 92.86%. In addition to improving cognitive achievement, the use of the Interactive Flat Panel also encouraged students' active participation, collaboration, self-confidence, and engagement throughout the learning process. Therefore, the utilization of an Interactive Flat Panel supported by interactive multimedia can serve as an alternative innovative instructional medium that supports the implementation of the Merdeka Curriculum and improves the quality of Islamic Religious Education learning at the elementary school level.

This study provides both theoretical and practical contributions to the development of Islamic Religious Education learning at the elementary school level. Theoretically, this study strengthens the body of knowledge concerning the effectiveness of digital instructional media based on Interactive Flat Panels (IFPs) in improving students' learning motivation and learning outcomes through a more interactive and student-centered learning approach. Practically, the findings can serve as a reference for Islamic Religious Education teachers in optimizing the use of technological facilities already available in schools to create learning experiences that are more innovative, engaging, and aligned with the characteristics of students in the digital era. Furthermore, this study provides an illustration of the implementation of Classroom Action Research (CAR) that can be used as a reference for teachers in conducting continuous improvements to the learning process. For schools, the findings are expected to serve as a basis for encouraging the improvement of teachers' competencies in using digital instructional media and optimizing technological facilities as part of educational transformation.

For future research, it is recommended that the utilization of Interactive Flat Panels (IFPs) be further developed by integrating various innovative learning models, such as Problem-Based Learning (PBL), Project-Based Learning (PjBL), Discovery Learning, and Deep Learning approaches, in order to obtain a more comprehensive understanding of the effectiveness of these media in developing various student competencies. Future studies may also involve larger numbers of participants, different educational levels, or multiple schools to achieve broader generalizability of the findings. In addition to examining learning motivation and cognitive learning outcomes, future research could investigate the effects of Interactive Flat Panel utilization on students' critical thinking, creativity, collaboration, digital literacy, and religious character development. Researchers are also encouraged to combine quantitative and qualitative approaches through mixed-methods research to obtain a deeper understanding of students' learning experiences and the effectiveness of digital media

implementation in Islamic Religious Education. Thus, future research is expected to generate instructional innovations that are more adaptive to technological developments and the educational needs of the twenty-first century.

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