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The Effectiveness of the Discovery Learning Model Assisted by an Interactive Flat Panel Display on Students' Learning Interest

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ABSTRACT
The background of this study lies in the importance of students' learning interest as a primary factor in the success of the learning process in Madrasah Ibtidaiyah, as well as the need for technology-based instructional innovation to enhance student engagement and motivation. This study aims to describe the effectiveness of the discovery learning model assisted by an Interactive Flat Panel Display (IFPD) on students' learning interest at MI Muhammadiyah Ngreco. This study employed a qualitative approach using a case study method. The research subjects consisted of one class implementing the discovery learning model supported by an Interactive Flat Panel Display. Data were collected through participatory observation, in-depth interviews with students and teachers, and documentation of learning activities. Data analysis was conducted using a descriptive-thematic approach to identify patterns and students' perceptions related to their learning interest. The findings indicate that the implementation of the discovery learning model assisted by an Interactive Flat Panel Display positively enhances students' learning interest. Students were observed to be more enthusiastic, active, and motivated during the learning process. The interactive media supported their engagement in exploring learning materials independently and in an enjoyable manner. In conclusion, the discovery learning model assisted by an Interactive Flat Panel Display is effective as a learning strategy to improve students' learning interest in Madrasah Ibtidaiyah. This study recommends the broader utilization of interactive technology as an instructional innovation in educational settings.

Keywords: Discovery Learning, Interactive Flat Panel Display, Learning Interest.

I. Introduction

Students' learning interest is an essential component in the educational process as it is closely related to learners' emotional and cognitive engagement during instruction (Xu, 2023). Students with high learning interest tend to be more active in exploring materials, participating in classroom activities, and constructing personal meaning from what they learn (Blinkoff, 2023; Solari, 2023). Conversely, low learning interest may lead to more passive learning experiences and hinder the optimal achievement of competencies (Xu, 2023). In the context of Madrasah Ibtidaiyah, learning practices that provide limited opportunities for diverse instructional strategies and active student participation may inhibit the optimal development of learning interest (Solari, 2023; Zhang, 2024). Contemporary studies indicate that learning innovations combining active learning strategies with interactive digital media have the potential to enhance students' learning interest. Discovery learning is a learning model that encourages students to independently discover concepts through

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exploration and reflective experiences (Bruner, 1961 as its theoretical foundation). Research by Rahmiyati (2025) found that discovery learning significantly improves elementary school students' learning interest and outcomes in a quasi-experimental context. Meanwhile, Hanatan (2023) reported that the development of interactive digital modules based on discovery learning successfully increased students' learning interest in online learning environments. In addition, a study by Laila (2024) showed that discovery learning supported by interactive Wordwall media improved students' critical thinking skills, which is one indicator of learning engagement. These findings confirm that integrating active learning strategies with interactive media contributes positively to students' affective aspects.

In addition to instructional strategies, interactive learning media has become an important focus in contemporary education. The Interactive Flat Panel Display (IFPD) is a digital medium that enables the presentation of materials in a visual, responsive, and collaborative manner. Research on the use of IFPD indicates that this medium can enhance students' motivation and engagement in the learning process (Indriansyah, 2025) and create a more dynamic learning environment (Kurniawan, 2024). These findings suggest that interactive digital media such as IFPD is not merely a technological tool but also a pedagogical medium that supports the implementation of active learning strategies. However, empirical research specifically integrating the discovery learning model assisted by IFPD to enhance students' learning interest in Madrasah Ibtidaiyah remains limited. This gap highlights the need for studies that describe the effects of integrating instructional strategies with interactive technology media within the MI context.

Based on this background, this study focuses on the effectiveness of the discovery learning model assisted by an Interactive Flat Panel Display on students' learning interest at MI Muhammadiyah Ngreco. The research question is: How effective is the implementation of the discovery learning model assisted by IFPD in improving students' learning interest at MI Muhammadiyah Ngreco? The objective of this study is to describe the effectiveness of integrating discovery learning and IFPD in enhancing students' learning interest, as well as to provide practical recommendations for implementing innovative learning in Madrasah Ibtidaiyah.

II. Literature Review

Students' learning interest is widely recognized as a crucial factor influencing the success of the educational process, particularly at the primary school level. Learning interest refers to a psychological tendency characterized by attention, enthusiasm, and a sense of enjoyment in learning activities. According to Xu (2023), students with high learning interest demonstrate stronger cognitive engagement and are more likely to achieve better academic outcomes. This is supported by Blinkoff (2023) and Solari (2023), who argue that learning interest encourages active participation, deeper exploration of content, and the development of meaningful learning experiences. Conversely, low learning interest often leads to passive behavior, reduced motivation, and limited academic achievement. Therefore, fostering students' learning interest is a fundamental goal in designing effective instructional practices, especially in Madrasah Ibtidaiyah, where students are in the early stages of cognitive and affective development.

One instructional approach that has been shown to enhance learning interest is the discovery learning model. Rooted in constructivist theory, discovery learning emphasizes students' active involvement in the process of acquiring knowledge through exploration, inquiry, and problem-solving (Bruner, 1961). In this model, students are not merely passive recipients of information but are guided to discover concepts independently, which promotes curiosity and intrinsic motivation. Rahmiyati (2025) found that the implementation of discovery learning significantly improved both learning interest and academic achievement among elementary school students. Similarly, Hanatan (2023) highlighted that discovery learning integrated with digital modules increased student engagement in online learning environments. These findings suggest that discovery learning provides meaningful learning experiences that can stimulate students' interest and participation.

In addition to instructional models, the use of interactive learning media has become increasingly important in contemporary education. Technological advancements have enabled the development of digital

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tools that support more engaging and interactive learning environments. One such tool is the Interactive Flat Panel Display (IFPD), which allows teachers to present learning materials visually, interactively, and collaboratively. According to Indriansyah (2025), the use of IFPD can enhance students' motivation and participation by providing dynamic and visually appealing content. Kurniawan (2024) also found that interactive digital media contribute to a more engaging classroom atmosphere, encouraging students to actively participate in learning activities. Thus, IFPD serves not only as a technological device but also as a pedagogical medium that supports student-centered learning.

The integration of discovery learning with interactive digital media such as IFPD offers a promising approach to improving students' learning interest. Laila (2024) demonstrated that combining discovery learning with interactive platforms like Wordwall can enhance students' critical thinking skills and engagement. This indicates that the synergy between instructional strategies and media plays a significant role in shaping students' learning experiences. By utilizing IFPD within a discovery learning framework, teachers can facilitate interactive exploration, collaborative discussion, and immediate feedback, all of which contribute to increased learning interest. Despite the growing body of research on discovery learning and interactive media, studies that specifically examine the integration of discovery learning assisted by IFPD in the context of Madrasah Ibtidaiyah remain limited. Most previous studies have focused on general primary education or different types of digital media. Therefore, this study seeks to fill this gap by providing an in-depth analysis of how the discovery learning model supported by IFPD influences students' learning interest in MI. This literature review highlights the theoretical and empirical foundations supporting the use of innovative, technology-enhanced learning strategies to foster students' engagement and motivation.

III. Research Method

This study employs a qualitative approach with a case study method to analyze the effectiveness of the discovery learning model assisted by an Interactive Flat Panel Display (IFPD) on students' learning interest at MI Muhammadiyah Ngreco. The case study method was chosen because it allows researchers to examine learning phenomena in depth within real-life contexts and to understand the dynamics of interactions among participants and the learning environment more comprehensively (Lim, 2025; Miles et al., 2013). The research informants included the head of the madrasah, curriculum staff, classroom teachers, and students, enabling the collection of diverse perspectives regarding the planning, implementation, and experiences of discovery learning supported by IFPD. Data were collected through semi-structured interviews, participatory observation, and documentation, including teaching materials, recorded learning sessions, and classroom notes to enrich the description of the phenomenon and the context of the case under study (Carmo, 2024; Schlunegger, 2024). Data analysis was conducted using a descriptive-thematic approach through stages of data familiarization, coding, theme development, interpretation, and systematic conclusion drawing (Naeem & Ali, 2024). To ensure data validity, this study applied source and technique triangulation and conducted member checking with key informants to ensure that the findings are credible and adequately represent the learning context (Lochmiller, 2026). Thus, the research findings can be considered trustworthy and representative of the learning context at MI Muhammadiyah Ngreco.

IV. Results and Discusion

4.1. Results

The research findings were obtained through interviews, classroom observations, and documentation, which complement each other in describing the implementation of the discovery learning model assisted by an Interactive Flat Panel Display (IFPD) at MI Muhammadiyah Ngreco. Classroom observations showed that the learning process was interactive and student-centered. The teacher acted as a facilitator by providing stimuli through visual displays, animations, and interactive activities on the IFPD.

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Students actively explored the material, asked questions, engaged in discussions, and participated in interactive quizzes and educational games. Recorded activities included reading materials from the screen, matching words with images, solving simple mathematics problems, and working in groups. The classroom atmosphere appeared dynamic, with high student engagement, emerging curiosity, and intensive interaction among students as well as between students and the learning media.

Interviews with classroom teachers, the head of the madrasah, and curriculum staff reinforced the observational findings. Teachers reported that the IFPD facilitated the delivery of materials and increased the variety of teaching methods, making students more focused and enthusiastic compared to conventional learning. The head of the madrasah and curriculum staff stated that the discovery learning model encouraged students to actively seek information and understand the material independently, while students mentioned that interactive screen-based activities were more enjoyable and motivated them to participate. Learning documentation, including photos, class recordings, and activity notes, demonstrated consistency between observation and interview results. The IFPD was actively used to present learning materials, and students' interaction with both the media and their peers was observed to increase. The documentation also showed a variety of activities supporting student engagement, such as interactive quizzes, educational games, and group collaboration. Dialectically, the findings from observations, interviews, and documentation complement and reinforce one another, indicating that the implementation of the discovery learning model assisted by IFPD at MI Muhammadiyah Ngreco is consistent, interactive, and capable of enhancing student engagement and learning interest, despite some technical challenges such as teachers' skills and the need for more thorough material preparation.

4.2. Discussion

The results of this study indicate that the implementation of the discovery learning model assisted by an Interactive Flat Panel Display (IFPD) at MI Muhammadiyah Ngreco creates a more interactive, student-centered learning process and enhances students' learning interest. Based on observations, students were actively engaged in exploring materials, asking questions, participating in discussions, and taking part in interactive quizzes and educational games. Interviews with teachers, the head of the madrasah, and curriculum staff confirmed that the use of IFPD facilitated material delivery and diversified teaching methods, while students reported that learning activities became more enjoyable and motivating. Learning documentation further supported these findings by showing consistent use of IFPD in presenting materials and increasing interaction among students and with the media. Some challenges identified included teachers' technical skills in operating the IFPD and the need for more careful preparation of instructional materials.

Theoretically, these findings are consistent with the principles of discovery learning, which emphasize learning through discovery, where students actively construct knowledge through direct experience and reflection (Wood et al., 1976). This model encourages students to ask questions, investigate, and independently discover concepts, thereby enhancing engagement and learning motivation (Rahmiyati, 2025). The use of interactive media such as IFPD supports the implementation of discovery learning by providing visual, auditory, and interactive stimuli that facilitate the exploration of abstract concepts into more concrete forms. These results are also in line with Hanatan (2023), who found that combining interactive digital modules with discovery learning increases students' interest and engagement.

From the perspective of learning interest, students' active involvement in exploratory activities through IFPD reflects affective, cognitive, and behavioral engagement in learning. This is evident in students' interest in the material, active participation, focused attention, and efforts to understand the content more deeply (Bergdahl, 2024; Zhang, 2024). Such exploratory activities are also aligned with findings that elementary school students' curiosity develops when teachers provide learning practices that allow space for exploration, feedback, and student expression (Scott-Barrett, 2023). Intensive interaction with media and peers also supports social and cognitive development, as emphasized in Vygotsky's social constructivist perspective, which highlights social interaction as the foundation of knowledge construction. This is relevant

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to findings that platform interactivity, social presence, and student connectedness significantly influence collaborative engagement in digital classrooms (Maksum, 2025). In this context, the IFPD is not merely a technological tool but a pedagogical medium that enables teachers to provide digital scaffolding through interactive visuals, touch-screen activities, prompts, quizzes, and collaborative tasks to strengthen students' engagement and cognitive presence in learning (Indriansyah, 2025; Lickona, 1992; Mamun, 2024; Umara, 2025).

The dialectical analysis of observations, interviews, and documentation demonstrates consistency in the findings: student activities observed in the classroom align with teachers' reports and documented learning evidence, thereby strengthening the credibility of the results. For instance, students' activities in solving mathematics problems and reading words through interactive media correspond with teachers' statements that this method improves students' focus and enthusiasm. The challenges encountered, such as limited teacher skills, highlight the importance of digital pedagogical competence as a supporting factor for effective learning (teacher readiness), as also identified by Indriansyah (2025).

Philosophically, these findings affirm that modern learning should be oriented toward direct experience and student interaction with media that support knowledge exploration, rather than merely the transmission of information from teacher to student. The use of IFPD within discovery learning demonstrates that technology can serve as a means to realize humanistic and constructivist education, where students become active subjects in constructing knowledge and teachers act as facilitators. This aligns with contemporary educational perspectives emphasizing that effective learning occurs when students learn through discovery, reflection, and collaboration, rather than passively receiving information (Kurniawan, 2024). Thus, the integration of the discovery learning model and IFPD can be considered effective in enhancing students' learning interest, strengthening their cognitive, affective, and social engagement, and creating a dynamic, interactive learning environment relevant to the demands of 21st-century education. These findings reinforce the argument that technology and active learning strategies must complement each other to produce meaningful and motivating learning experiences.

V. Conclusion

The implementation of the discovery learning model assisted by an Interactive Flat Panel Display (IFPD) at MI Muhammadiyah Ngreco has been proven to create a more interactive, student-centered learning process and to enhance students' learning interest. Students were actively involved in exploring materials, engaging in discussions, and completing interactive activities, while teachers acted as facilitators guiding independent concept discovery. The results of observations, interviews, and documentation show consistent findings that the integration of IFPD enables more varied and engaging learning, motivates students, and improves their cognitive, affective, and social engagement.

Furthermore, this study confirms that the use of IFPD within the framework of discovery learning provides opportunities for teachers to create meaningful, enjoyable, and relevant learning experiences aligned with 21st-century educational needs. The challenges identified, such as limited teacher skills and the need for thorough material preparation, highlight the importance of developing digital pedagogical competence. Overall, this model effectively addresses the research problem by demonstrating that the integration of discovery learning and interactive media can consistently and sustainably enhance students' motivation, participation, and learning interest.

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