

## The Use of Interactive Flat Panel (IFP) Technology as a Medium for Strengthening Social Interaction in Learning at SMPN Ma'arif 1 Ponorogo

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### Abstract

Interactive Flat Panel (IFP) technology is a digital learning innovation that not only functions as a medium for delivering material, but also as a means of strengthening social interaction in the learning process. This study was motivated by the limited social interaction among junior high school students in conventional learning, which has resulted in low participation, cooperation, and communication among students. This study aims to describe and analyze the use of IFP technology in strengthening student social interaction through interactive learning activities such as class discussions, group work, presentations, and collaborative quizzes. The research used a descriptive approach with interpretive analysis of questionnaire data given to students at SMPN Ma'arif 1 Ponorogo. The results showed that the use of IFP was able to increase the intensity of social interaction, both between students and between students and teachers, especially through collaboration-based and gamification activities. However, there were still technical obstacles and limitations in the teachers' competence in optimizing the IFP function. This study confirms that the appropriate use of IFP can be a strategic tool in strengthening student social interaction and supporting collaborative and learner-centered learning.

### Keywords

Interactive Flat Panel; Social Interaction; Junior High School Learning; Innovation



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## **1. INTRODUCTION**

Developments in information and communication technology have significantly changed the way schools learn. The integration of technology into the learning process not only serves as a tool, but also as a way to create a more engaging and meaningful learning experience (Smaldino, Lowther, and Russell, 2019). One type of learning technology that is increasingly popular in classrooms is the Interactive Flat Panel (IFP) or interactive touch screen. IFP is a technology-based device that combines the functions of a digital whiteboard, projector, and computer in one touch screen, enabling direct interaction between teachers, students, and the material being taught. In addition to its impact on material comprehension, the use of learning technology also plays an important role in building social interaction between students and between students and teachers.

Social interaction in learning is an important aspect in the development of junior high school students, because at this stage students are building communication, empathy, and cooperation skills. Based on initial observations and information from students, the use of IFP in the classroom is used for various learning activities, such as explaining material, watching educational videos, group presentations, and doing quizzes or digital-based educational games such as Quizizz and Kahoot. The use of these features shows that IFP has great potential in supporting interactive and participatory learning. This is in line with the concept in learning media theory which states that effective media can present information visually, audibly, and kinesthetically, thereby improving students' understanding and memory.

Despite its great potential, initial observations and information from students indicate that the use of IFPs has not been fully effective. Some students revealed that learning with touchscreen TVs only sometimes helped them understand the material, while others felt that it was ineffective. Several obstacles have arisen, including teachers experiencing difficulties when using IFPs, students losing concentration during lessons, and technical problems such as malfunctioning devices or unstable internet connections. These problems indicate a gap between the availability of technology and teachers' pedagogical and technological abilities to use it effectively.

This issue is highly relevant for discussion because effective learning requires active and meaningful interaction. Based on the interaction theory proposed by

Moore in 1989, there are three main types of interaction that influence learning, namely interaction between teachers and students, students with students, and students with material. Technology such as IFP must be able to support all three types of interaction simultaneously. In media theory, interactive learning media can help explain messages, reduce excessive use of words, and increase student motivation to learn, as explained by Arsyad in 2020. If IFP technology is not utilized to its full potential, its function as an interactive learning medium will not be fully realized.

The purpose of this article is to describe and analyze the application of Interactive Flat Panel (IFP) technology in the learning process based on the results of a student questionnaire. In addition, this article also aims to assess the extent to which the use of IFP can increase interaction in learning, understanding of material, cooperation between students, and create a pleasant learning atmosphere, as reviewed from interaction theory and learning media theory.

This article will focus on the use of IFP in the classroom learning process from the students' perspective, the analysis of the role of IFP in improving learning interaction according to interaction theory, a study of IFP as a learning medium based on media theory, and the factors that support and hinder the application of IFP technology in learning. Thus, it is hoped that this article can provide a more complete understanding of the contribution of IFP technology in creating an interactive and effective learning experience.

## 2. METHODS

This study uses a descriptive approach with interpretive analysis of questionnaire data to examine the use of Interactive Flat Panel (IFP) technology in strengthening student social interaction. This study uses a descriptive approach with interpretive analysis of quantitative data obtained through student questionnaires that emphasize the exploration of meaning, deep understanding, concepts, characteristics, indications, symbols, and descriptions of a phenomenon, with an intense, multi-method, natural, and holistic focus, prioritizing quality, using various techniques, and presented narratively. This research was conducted from September 2025 to November 2025 during the odd semester of the 2025/2026 academic year, involving junior high school students in Ponorogo.

The research instrument used was a structured questionnaire administered to students as respondents. The questionnaire contained a number of statements and closed-ended questions related to the use of interactive flat panel (IFP) TVs in learning, covering aspects such as frequency of use, types of learning activities, ease of use, level of understanding of the material, group cooperation, and obstacles in using IFPs. The alternative answers were arranged in the form of multiple choice and attitude scales to make it easier for respondents to provide objective answers.

Data collection was conducted by distributing questionnaires to students after they participated in lessons using IFP technology. The respondents in this study were students at SMPN Ma'arif 1 Ponorogo. Before distribution, the questionnaires underwent a review process to ensure clarity of language and suitability of indicators for the research objectives. The collected data was then analyzed, and the results of the data analysis were presented in the form of a descriptive description to provide a clear picture of students' perceptions of the effectiveness of using IFP in learning. Through this method, it is hoped that accurate and comprehensive information can be obtained regarding the role of IFP technology in supporting interaction, understanding of material, and student engagement in the learning process.

### **3. FINDINGS AND DISCUSSION**

#### **3.1. The Use of Interactive Flat Panel Technology at SMPN Ma'arif 1 Ponorogo**

The findings of this study reveal several important aspects regarding the use of Interactive Flat Panel (IFP) technology in the learning process at SMPN Ma'arif 1 Ponorogo. Overall, the results indicate that although the utilization of IFP by teachers is still limited, students demonstrate a predominantly positive response toward its implementation, particularly in terms of engagement, collaboration, and learning enjoyment.

In terms of usage frequency, the questionnaire results show that only 39.6% of students reported that their teachers use IFP during classroom instruction, while a larger proportion of students (60.4%) stated that IFP is not commonly used by teachers. This finding suggests that the integration of IFP technology into daily teaching practices has not yet been fully realized. The relatively low level of usage indicates that traditional teaching methods may still dominate classroom activities, despite the availability of digital learning tools that have the potential to enhance instructional quality.

When IFP is used, the types of learning activities conducted tend to emphasize interactive and student-centered approaches. The most frequently reported activity is participation in quizzes or educational games, such as Quizizz and Kahoot, selected by 50.9% of respondents. Other activities include explaining learning materials (24.5%), watching instructional videos (13.2%), and conducting group presentations (11.3%). These findings demonstrate that IFP is primarily utilized as a medium for interactive learning rather than as a conventional presentation tool. The dominance of quiz-based activities suggests that teachers tend to use IFP to create a more engaging learning atmosphere, encouraging active participation and immediate feedback from students.

Regarding students' understanding of learning materials, the majority of respondents (54.7%) indicated that the use of IFP helps them better understand the lessons being taught. Meanwhile, 39.6% of students reported that IFP only sometimes helps their understanding, and a small proportion (5.7%) stated that it does not help at all. These results imply that IFP generally supports students' comprehension, particularly when it is used in conjunction with interactive learning strategies. The variation in responses also suggests that the effectiveness of IFP may depend on how it is implemented and how well learning activities are aligned with students' needs.

The ease of using IFP is influenced by several supporting factors identified by students. A substantial majority of respondents (83%) stated that attractive learning materials, such as images and videos, are the main factor that makes IFP easy to use. In addition, 11.3% of respondents emphasized teachers' ability to operate the device effectively, while 5.7% highlighted stable internet connectivity as a contributing factor. These findings indicate that both pedagogical and technical aspects play a crucial role in determining the effectiveness of IFP usage. Engaging visual content and teachers' technological competence appear to significantly enhance students' learning experiences.

Despite these positive aspects, several obstacles hinder the optimal use of IFP in the classroom. The most dominant issue reported by students (67.9%) is technical problems, including system errors and slow device performance. Furthermore, 24.5% of respondents identified students' lack of focus as a limiting factor, while 7.5% reported that teachers experience difficulties in operating IFP. These findings highlight that technical reliability and teacher readiness remain key challenges in implementing technology-based learning. Without proper device maintenance and sufficient training for teachers, the potential benefits of IFP may not be fully achieved.

The results also indicate that IFP has a positive influence on students' group collaboration. More than half of the respondents (54.7%) stated that IFP is very helpful in supporting teamwork, while 39.6% reported that it provides some assistance, and only 5.7% felt that it does not help at all. This suggests that IFP facilitates collaborative learning environments, particularly through group-based quizzes, presentations, and visually supported discussions that require students to communicate and work together.

In terms of students' preferences, game-based and quiz activities emerge as the most favored learning activities when using IFP, chosen by 56.6% of respondents. Watching instructional videos ranks second at 20.8%, followed by group presentations at 13.2%, and direct interaction with the touchscreen to answer questions at 9.4%. These preferences indicate that students are more attracted to learning activities that involve active participation and elements of gamification, which contribute to higher levels of engagement and motivation.

Finally, students' perceptions of learning enjoyment further reinforce the positive impact of IFP. A total of 67.9% of respondents stated that learning with IFP is very enjoyable, while 32.1% described it as average, and none of the respondents perceived it as boring. This finding suggests that IFP creates a more enjoyable learning environment and has strong potential to increase students' motivation and interest in classroom learning.

### **3.2. Analysis of IFP Use at Ma'arif 1 Ponorogo Public Junior High School**

The use of Interactive Flat Panel (IFP) technology in junior high school settings demonstrates a significant contribution to strengthening social interaction, both among students and between teachers and students. This finding aligns with modern learning theories that emphasize the importance of interaction, collaboration, and active student participation in the learning process. According to Vygotsky's social constructivist theory (1978), learning occurs most effectively through social interaction, shared activities, discussion, and collaborative work. In this context, IFP functions as a *mediating tool* that facilitates such interactions by providing a shared digital and visual space where students and teachers can engage collaboratively.

The questionnaire results indicate that more than half of the students perceive the use of IFP as helpful in improving their understanding of learning materials (54.7%) and as highly supportive of group collaboration (54.7%). These findings reinforce the principles of social constructivism, which view knowledge as

something constructed collectively through social interaction rather than transmitted passively from teacher to student. When students interact with visual displays, videos, or interactive quizzes on the IFP, they are not merely receiving information; instead, they actively communicate, discuss ideas, and solve problems together. Such activities represent meaningful forms of social interaction that enhance cognitive development and deepen learning.

Furthermore, these findings can be explained through the framework of Computer-Supported Collaborative Learning (CSCL), which emphasizes the role of technology in facilitating structured collaborative learning activities (Stahl, Koschmann, & Suthers, 2006). The preference for game-based and interactive quiz activities (56.6%) strongly supports this theory. Game-based learning implemented through IFP not only increases student engagement but also creates opportunities for social interaction, such as sharing strategies, working in teams, negotiating roles, and jointly completing learning tasks. These collaborative experiences help develop students' communication skills, teamwork, and social competence.

In addition, the effectiveness of IFP use is consistent with Mayer's Multimedia Learning Theory (2005), which posits that learning is more effective when instructional materials combine text, images, and video rather than relying on a single mode of information. This is reflected in the finding that 83% of respondents reported that the ease of using IFP is largely influenced by the presence of attractive learning materials, such as images and videos. The high-quality visual features of IFP not only facilitate comprehension of learning content but also stimulate discussion and interaction, as students are able to refer to the same visual representations during collaborative learning activities.

On the other hand, technical barriers such as device errors or slow system performance (67.9%) indicate that the integration of technology in education is also influenced by infrastructural readiness and technical reliability. This issue can be analyzed through the Technology Acceptance Model (TAM) proposed by Davis (1989), which highlights perceived ease of use and perceived usefulness as key determinants of technology adoption. Frequent technical problems may reduce both teachers' and students' willingness and ability to fully utilize IFP, thereby limiting opportunities for effective interaction and collaboration during learning.

Despite these challenges, the majority of students (67.9%) perceived learning with IFP as very enjoyable. This finding supports the Self-Determination Theory proposed by Deci and Ryan (2000), which emphasizes the role of intrinsic motivation

in learning. Feelings of enjoyment and high engagement emerge when students experience autonomy, competence, and relatedness in learning activities. IFP-based learning environments provide opportunities for active participation, creativity, and peer interaction, thereby fulfilling these psychological needs and enhancing students' intrinsic motivation.

Overall, the findings suggest that the use of IFP at the junior high school level not only enhances students' understanding of learning materials but also significantly strengthens social interaction through collaborative activities, interactive discussions, and group work. IFP serves as a connective tool that links students, teachers, and learning content in ways that align with the principles of cooperative learning, social constructivism, and multimedia-based instruction. With adequate infrastructure support and continuous teacher training, IFP holds strong potential to create more meaningful, interactive, and student-centered learning experiences.

#### **4. CONCLUSION (Palatino Linotype 12, Space 1.15, Justify)**

Based on the findings of this study, it can be concluded that the use of Interactive Flat Panel (IFP) technology as a learning medium plays a significant role in strengthening students' social interaction at SMPN Ma'arif 1 Ponorogo. IFP functions not only as a tool for delivering learning materials but also as an interactive medium that encourages active student engagement through discussion, group work, and technology-based collaboration. Learning activities that incorporate gamification and visual elements have proven effective in increasing students' enthusiasm, participation, and cooperation.

Although the frequency of IFP use by teachers remains relatively low, students demonstrate a highly positive response to its implementation in the classroom. Most students report that IFP helps them better understand learning materials and supports teamwork, leading to more dynamic and meaningful social interaction in the classroom. These findings support the principles of social constructivism, Computer-Supported Collaborative Learning (CSCL), and multimedia learning, which emphasize the importance of interaction, collaboration, and the use of visual and digital media in the learning process.

Nevertheless, the implementation of IFP still faces several challenges, including technical problems, limited supporting infrastructure, and the insufficient



digital readiness and competence of teachers. These constraints align with the Technology Acceptance Model (TAM), which highlights perceived ease of use and perceived usefulness as key factors influencing technology adoption and effectiveness. Therefore, efforts are needed to enhance teachers' digital competencies through continuous training, ensure regular maintenance of technological equipment, and design learning activities that prioritize the development of students' social interaction.

Overall, Interactive Flat Panel (IFP) technology can be considered an effective learning medium for creating an enjoyable, interactive, and collaborative classroom environment. With optimal management and support, IFP has strong potential to become an integral component of student-centered learning in the digital era, while also fostering students' social skills and digital literacy. Future research is recommended to employ direct classroom observation methods to gain deeper insights into students' social interaction patterns during IFP-based learning activities.

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