

Implications of Interactive Flat Panel (IFP) on Science Learning in Elementary Schools

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Abstract:

The use of technology makes it easier for teachers to deliver material more clearly, so that students quickly respond to understanding learning concepts. One of these is the use of Interactive Flat Panels (IFP). IFP is a touch-based interactive screen device capable of displaying various multimedia content, such as images, videos, animations, and learning simulations. The use of this technology provides opportunities for teachers to present material visually and interactively so as to increase student attention and engagement during the learning process. The challenges during the implementation of learning include time constraints and teachers' less than optimal mastery of advanced IFP features. Thus, the use of IFP requires teachers' readiness in operating technology and the ability to manage learning so that its use can run optimally. This type of research is qualitative research with a descriptive approach. The qualitative approach was chosen because this study aims to describe in depth the use of Interactive Flat Panels (IFP) in science learning in elementary schools and its implications for student learning activities. Based on the results of data collection through questionnaires given to 90 fifth-grade students consisting of classes VA, VB, and VC, data was obtained regarding student responses to the use of Interactive Flat Panels (IFP) in science learning. Data analysis was conducted on five aspects: interest, focus/attention, activity, understanding, and enthusiasm. The results showed that the total score obtained reached 4,632 out of a maximum score of 6,750 with a percentage of 68.6%. Overall, the use of Interactive Flat Panel (IFP) in science learning in elementary schools has a positive impact on the learning process. This is evident from the overall percentage of 68.6%, which is included in the good category. These results indicate that IFP is able to increase student interest, activity, and enthusiasm in participating in learning. However, there is still a need for optimization in the aspect of material understanding.

Keywords: *Interactive Flat Panel (IFP), Science and Social Studies Learning (IPAS), Elementary School Education.*

INTRODUCTION

The development of information and communication technology has brought changes to various fields of life, including education. The utilization of technology in the learning process provides opportunities for teachers to create learning activities that are more interactive, engaging, and appropriate to the characteristics and development of students. The use of technology-based learning media not only functions as a tool for delivering learning materials but can also support student engagement throughout the learning process.

One of the technologies that has begun to be utilized in education is the Interactive Flat Panel (IFP). IFP is an interactive display device that allows teachers to present learning materials in the form of visuals, videos, images, animations, and interactive activities. The use of IFP can create a more

dynamic learning environment because students do not merely receive information passively but can also participate in the learning process through various displays and activities provided.

In elementary science learning, the use of engaging learning media is important because science learning requires not only the ability to remember concepts but also an understanding of various phenomena and processes occurring in the surrounding environment. The use of technology-based media such as IFP can help teachers present learning materials in a more concrete and visual manner, thereby potentially increasing students' attention and engagement in learning.

Several previous studies have demonstrated the benefits of using technology and interactive learning media in the learning process. Studies by (Nasukha et al., 2026), (Apriani & Wahyuni, 2026), (Firdaus & Maisaroh, 2025), (Hikmah et al., 2026), (Hadi et al., 2026), (Suryandari et al., 2026), and (Ardiansa, 2026) indicate that the utilization of learning media and technology can have positive effects on students' motivation, attention, activity, engagement, and learning outcomes. These findings indicate that the use of interactive technology has the potential to support the creation of a more engaging and participatory learning process.

Nevertheless, the previous studies discussed in this research have primarily demonstrated the benefits of learning technology in general, such as improvements in motivation, attention, activity, engagement, and learning outcomes. What remains insufficiently understood is how the use of Interactive Flat Panel (IFP) affects various aspects of student learning activities simultaneously in elementary science learning. In addition, the presence of IFP does not automatically indicate that all aspects of student learning have developed optimally. Therefore, a more comprehensive understanding is needed regarding how IFP affects students' interest, focus/attention, activity, understanding, and enthusiasm, as well as which aspects of learning still require further improvement.

This research gap is important to examine because the use of IFP should not only be viewed in terms of the availability or utilization of technological devices in the classroom but also from the perspective of students' responses and learning experiences during the learning process. Therefore, research on IFP needs to consider various aspects of student learning activities comprehensively in order to determine whether the use of this medium has optimally supported the learning process.

Based on observations conducted during the Teaching Practice Program (Praktik Pengalaman Lapangan/PPL), the use of IFP in learning showed positive responses from students. Students appeared more interested and enthusiastic when learning materials were presented through visual displays and interactive activities. However, several challenges were still encountered in its implementation, including limited instructional time and teachers' ability to utilize all IFP features optimally. This condition indicates that the use of IFP needs to be examined not only in terms of student interest but also based on various aspects of learning activities that emerge during the learning process.

Based on the above description, this study was conducted to provide an overview of the implications of using Interactive Flat Panel (IFP) in elementary science learning. The study specifically analyzes five aspects of student learning activities: interest, focus/attention, activity, understanding, and enthusiasm. The analysis of these five aspects is expected to provide an overview of the learning aspects that have received positive responses through the use of IFP as well as those that still require optimization. Therefore, this study focuses on the question of how the use of IFP affects various aspects of student learning activities in elementary science learning and which aspects still need to be strengthened in its implementation.

METHODOLOGY

This study employed a descriptive quantitative approach to describe the implications of using Interactive Flat Panel (IFP) in elementary science learning based on students' responses. The descriptive approach was used to systematically describe the phenomenon occurring without providing any particular treatment or experimental intervention to the research subjects (Nurhasanah et al., 2026).

The selection of the descriptive quantitative approach was based on the use of a questionnaire as the primary source of research data. The questionnaire was used to obtain data regarding students' responses to the use of IFP in science learning. The data obtained were then analyzed in the form of scores and percentages. Thus, this study focuses on describing students' responses based on data obtained from the field.

The research was conducted during science learning activities using IFP. The research subjects consisted of 90 fifth-grade students from classes VA, VB, and VC. In addition to the students, teachers and several students were involved in observations and interviews as supporting sources of data.

Data Collection Technique

The data collection techniques used in this study included **observation, interviews, questionnaires, and documentation.**

1. Observation.

Observation was conducted directly during the science learning process using IFP. The observation aimed to obtain an overview of the learning process, student engagement, and the use of IFP during learning activities. Through observation, the researcher was able to obtain data based on the actual learning conditions occurring in the classroom (Sugiyono, 2023).

2. Interviews.

Interviews were conducted with teachers and several students to obtain supporting information regarding their experiences, the benefits, and the challenges associated with the use of IFP in science learning. The interview results were used to complement and provide context for the data obtained through questionnaires and observations.

3. Questionnaire.

The questionnaire served as the primary source of research data and was used to determine students' responses to the use of IFP in science learning. The questionnaire was administered to 90 fifth-grade students from classes VA, VB, and VC. The questionnaire was developed using a five-point Likert scale. The questionnaire instrument was used to measure five aspects of student learning activities: interest, focus/attention, activity, understanding, and enthusiasm. These five aspects served as the basis for analyzing students' responses to the use of IFP. The interest aspect was used to describe students' level of interest in learning using IFP. The focus/attention aspect was used to describe students' attention during the learning process. The activity aspect described students' involvement in learning activities. The understanding aspect described students' ability to understand the learning materials presented through IFP. Meanwhile, the enthusiasm aspect described students' enthusiasm and positive responses while participating in learning activities using IFP. The use of questionnaires was considered appropriate for obtaining data regarding students' responses, attitudes, and learning experiences toward the use of technology in education (Lewohl, 2023).

4. Documentasion.

Documentation was used to complement the research data in the form of photographs of learning activities, learning materials, and other supporting documents. Documentation served as supporting data to strengthen the description of the implementation of science learning using IFP.

Research Subjects

The research subjects consisted of 90 fifth-grade elementary school students who participated in science learning using IFP. The respondents consisted of students from classes VA, VB, and VC. Teachers and several students also served as sources of information through interviews to obtain supporting data regarding their experiences with and the use of IFP in learning.

The subjects were selected using purposive sampling, taking into consideration the involvement of teachers and students in science learning activities using IFP.

Figures and Tables

The figures and tables used in this study are presented as follows.

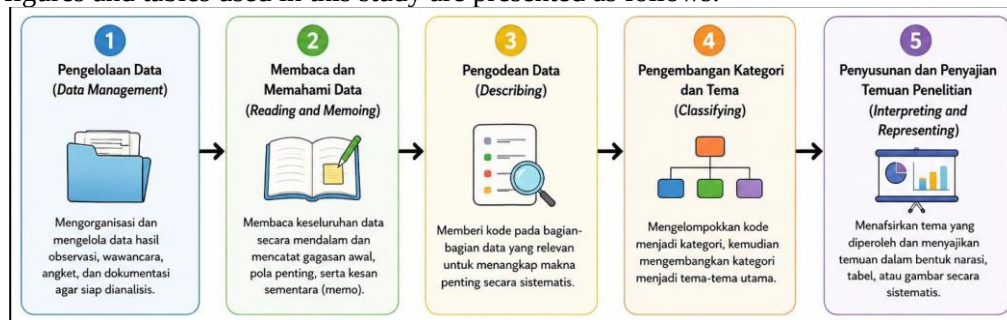


Figure 1. Five-Phase Qualitative Data Analysis Stages (Bingham, 2023)

Source: Bingham, (Bingham, 2023), The Five-Phase Qualitative Data Analysis Approach *International Journal of Qualitative Methods*, 22,1-12.

Score	Category
5	Strongly agree
4	Always
3	Doubtful
2	Don't agree
1	Strongly Disagree

Table 1. Likert Scale

Source: Rokeman (2024) Likert Measurement Scale in Educational and Social Science: Explored and Explained.

Data Analysis Technique

The primary data obtained through the questionnaire were analyzed using descriptive quantitative analysis. The analysis was conducted by calculating the scores obtained from all students' responses for each aspect and then converting the scores into percentages.

The percentage of students' responses was calculated using the following formula:

$$\text{Percentage} = (\text{Obtained Score} / \text{Maximum Score}) \times 100\%$$

The calculated results were then used to describe students' responses across the five aspects of learning activities: interest, focus/attention, activity, understanding, and enthusiasm.

Based on the data analysis, the interest aspect obtained a score of 1,011 or 75%, focus/attention obtained a score of 900 or 67%, activity obtained a score of 990 or 73%, understanding obtained a score of 742 or 55%, and enthusiasm obtained a score of 989 or 73%. Overall, the total score obtained was 4,632 out of a maximum score of 6,750, or 68.6%. The data obtained from observations, interviews, and documentation were used as supporting data to provide further explanation of the questionnaire results. Thus, the quantitative data from the questionnaire served as the primary basis for describing students' responses, while the observation, interview, and documentation data were used to enrich the interpretation of the research findings.

Data Analysis Stages

The data analysis was conducted through the following stages:

1. Data collection, through questionnaires, observations, interviews, and documentation.
2. Questionnaire data tabulation, by grouping the responses of 90 students according to the five aspects of learning activities.
3. Score calculation, by summing the students' response scores for each aspect.
4. Percentage calculation, by comparing the obtained score with the maximum score.
5. Result categorization, based on the percentage categories used in the study.
6. Result interpretation, by relating the questionnaire findings to supporting information obtained through observations, interviews, and documentation.

Through these stages, the study provides an overview of the implications of IFP use for student learning activities in elementary science learning based on five aspects: interest, focus/attention, activity, understanding, and enthusiasm.

RESULTS AND DISCUSSION

A. Result

Based on the results of data collection through a questionnaire given to 90 fifth-grade students consisting of classes VA, VB, and VC, data was obtained regarding student responses to the use of Interactive Flat Panels (IFP) in science learning. Data analysis was carried out on five aspects, namely interest, focus/attention, activeness, understanding, and enthusiasm.(Lesmana & Afriansyah, 2024).

Indicator	VA Class Score	VB Class Score	VC Class Score	Total
Interest	373	316	322	1011
Focus	323	262	315	900
Activity	360	308	322	990
Understanding	286	216	240	742
Enthusiasm	359	321	309	989

The results of the study showed that the total score obtained reached 4,632 from a maximum score of 6,750 with a percentage of 68.6%.

Aspect	Score	Percentage	Category
Interest	1011	75%	Good
Focus	900	67%	Good
Activity	990	73%	Good
Understanding	742	55%	Enough
Enthusiastic	989	73%	Good

Based on the data interpretation category, this percentage falls into the good category. These results indicate that the use of IFP has a positive impact on the science and science learning process in elementary schools.

In terms of interest, the score was 1,011, representing a 75% percentage. These results indicate that students exhibit a positive interest in science learning using IFP. The use of visual-

based media such as images, videos, and animations captures students' attention, making them more engaged in learning activities. The more engaging and interactive presentation of the material helps create a less monotonous learning environment.(Aprilia et al., 2026).

The focus or attention aspect scored 900, or 67%, which is considered good. These results indicate that the use of Interactive Flat Panels (IFPs) is quite effective in helping students focus during the learning process. This finding aligns with research.Jumiati et al. (2025)which shows that the use of IFP can increase student focus, learning motivation, and student engagement in science learning. In addition,Suryandari et al. (2026)explains that the use of IFP can create a more lively and engaging learning process, enabling students to be more actively involved in class activities. However, some students still experience concentration problems or are easily distracted by other factors in the learning environment. Therefore, good classroom management strategies are needed to optimally maintain student attention during the use of learning media. Various studies have shown that Interactive Flat Panels can increase learning motivation, two-way communication, and student engagement, thus making learning more student-centered.(Amilatun Nasiba, 2026)

In terms of activity, the score was 990, representing a percentage of 73%. These results indicate that the use of interactive learning media, such as Interactive Flat Panels (IFPs), can encourage student activity in the learning process. The use of interactive technology-based media makes students more involved in learning activities, such as asking questions, answering questions, and actively participating in learning. This is in line with research findings that state that the use of multimodal and interactive learning media can increase student activity, marked by increased participation, focus, and involvement in the learning process.(Savitri et al., 2025;Nasti et al., 2025)The results of this study are also supported by a systematic review which shows that the use of Interactive Flat Panels in elementary schools has a positive impact on students' learning activity, collaboration, and critical thinking skills.(Siti Khasanah Maisaroh, 2026)

Meanwhile, the comprehension aspect scored 742 with a percentage of 55%, which is the lowest percentage compared to other aspects. These results indicate that although the use of interactive learning media, such as Interactive Flat Panels (IFP), can increase student engagement and activeness in learning, the improvement in conceptual understanding is not fully optimal. This is in line with research findings that show that the use of interactive media can increase student participation, but conceptual understanding still requires reinforcement through teacher explanations and more in-depth follow-up activities.(Aulia et al., 2025;Savitri et al., 2025).

In terms of enthusiasm, the student achieved a score of 989, representing a percentage of 73%. These results indicate that students exhibit high levels of enthusiasm for science learning using Interactive Flat Panels (IFPs). This high level of enthusiasm is evident in their enthusiasm for participating in learning activities and their active involvement throughout the learning process. The use of interactive learning media also creates a more lively and enjoyable classroom atmosphere, increasing students' emotional engagement and participation in learning.(Luthfiyah et al., 2025;(Hikmah et al., 2026)Other research shows that the use of Interactive Flat Panels can create a more enjoyable learning experience through the integration of multimedia and touch-based activities, thereby increasing students' learning motivation.(Nadhifah, Siti, 2026).

B. Discussion

Overall, the use of Interactive Flat Panels (IFPs) in elementary school science lessons has had a positive impact on the learning process. This is evident in the overall percentage of 68.6%, which falls into the good category. These results indicate that IFPs can increase student interest, activeness, and enthusiasm in participating in learning. Visual and interactive learning media help create a more engaging and less monotonous learning environment.

This finding is in line with research showing that the use of technology-based learning media can increase student attention and help in understanding the material, because the presentation is more visual and interactive.(Krisyanto et al., 2024;(Nasuha & Elfrianto, 2025)However, the low results in the comprehension aspect (55%) indicate that the use of media alone is insufficient without in-depth explanations from the teacher. This is also supported by research stating that

students' conceptual understanding is still influenced by the teacher's role in providing guidance and direct reinforcement of the material in class.(Sihombing et al., 2025).

Thus, it can be concluded that the use of IFP has positive implications for science learning, especially in increasing aspects of student interest, activity, and enthusiasm, but still needs optimization in the aspect of understanding the material.

CONCLUSION

Based on the results of research on the implications of using Interactive Flat Panels (IFPs) for science learning in elementary schools, it can be concluded that the use of IFPs has a positive impact on the learning process. These research findings further strengthen empirical evidence that Interactive Flat Panels are an effective digital learning media innovation in improving the quality of the learning process and student engagement.(Riyadi et al., 2024)

This is evidenced by the questionnaire results, which showed a percentage of 68.6% in the good category. More specifically, students' interest, activeness, and enthusiasm were in the good category, while their understanding was in the fair category. Thus, the use of IFP in science learning can create a more engaging and interactive learning environment, but still requires optimization to improve students' conceptual understanding.

Teachers are expected to maximize the use of IFP not only as a visual medium but also as a tool to deepen students' conceptual understanding. Students are expected to be more active in learning to improve their understanding of the material. Future researchers can expand this research with broader variables or different methods.

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