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Analysis of Teacher Difficulties in Using Smart Board Technology in Primary School : A Case Study at SDN 2 Pilangsari

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ABSTRACT

This study aims to analyze the challenges faced by teachers in utilizing Smart Board as a technology-based learning media at SDN 2 Pilangsari. The background of the research is based on the gap between the potential to increase students' learning motivation through technology and the implementation constraints in the field. Using a qualitative approach through in-depth interviews with teachers, the research revealed five main challenges: (1) limited teacher training, (2) lack of technical understanding, (3) lack of IT support, and (4) difficulty integrating technology with teaching materials (5) impact of student depence. The findings provide practical contributions in the form of recommendations for the development of more effective teacher training programs as well as policy implications in the provision of supporting infrastructure. Theoretically, this study enriches the literature on the adoption of educational technology in primary schools by emphasizing the aspect of teacher readiness as a critical factor for successful implementation.

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1. INTRODUCTION

Learning media is a medium or tool used by teachers as a means to convey messages from learning sources to students (Winda Pratiwi1, 2024). As technology advances globally, particularly in education, it consistently introduces innovations in learning. The development of education at this time can be characterized by technological advances used by teachers as a learning media (Arvianto & Widayati, 2020). An educational innovation is the implementation of technology-driven learning tools, such as Smart Boards. This interactive board has numerous advantages, such as enhanced interactivity, captivating visual representations, and the capacity to convey educational materials dynamically (Koc, 2023). Nonetheless, numerous educators encounter challenges in its use throughout the learning process.

SDN 2 Pilangsari is one of the primary education institutions that tries to integrate technology into the learning process. However, initial observations show that teachers face various barriers in effectively utilizing the Smart Board. These challenges include the lack of adequate training, limited infrastructure and difficulties in adjusting teaching methods to suit the use of this technology. This became the basis for conducting more in-depth research through a direct interview approach with teachers. This technological development, unfortunately, is not supported by the progress of human resources who are able to keep up with changes in the world of education (Winda Pratiwi1, 2024).

This study aims to analyze the difficulties experienced by teachers of SDN 2 Pilangsari in implementing Smart Board for mathematics learning. Using a qualitative approach through in-depth interviews and classroom observations, this study seeks to identify barriers to technology integration and formulate appropriate solutions. The research findings are expected to improve the effectiveness of using technology-based learning media, especially in creating a more interactive learning environment for students. Although Smart Board offers various advantages such as dynamic presentation of materials and increased student engagement (Mulyosari &

Khosiyono, 2023), in practice many teachers still experience difficulties in its utilization. This suggests the need for an in-depth study of the challenges of technology implementation at the primary school level to ensure optimal utilization.

2. METHOD

The method applied in this research is a qualitative approach. Qualitative research is a research method applied in natural conditions, where the data collected and analysis are qualitative, and the research results emphasize meaning rather than generalization (Sugiyono, 2015). Qualitative research is research whose results are not obtained through a statistical process, but through data collection, qualitative data analysis, and interpretation with the aim of understanding certain phenomena (Anggito & Setiawan, 2018).
This research approach focuses on the subject's experience when interacting with a phenomenon. This study research to describe the challenges faced by teachers in utilizing digital technology-based learning media (Yeni et al., 2020). This research was conducted at SDN 2 Pilangsari the research involved semi-structured interviews with three teachers, each lasting 30-45 minutes. The data collection technique used was interviews. The data analysis technique used consists of three stages, namely data reduction, data presentation, and conclusion.

3. RESULT AND DISCUSSION

3.1 Results of Analysis of Difficulties in Using Smart Board
Using 4D models, this smart board medium was developed. The process must go through four stages: defining, designing, developing, and deploying (Mumpuni & Mulyawati, 2024). This research analyzes the difficulties experienced by teachers at SDN 2 Pilang Sari in implementing smart board as a learning media. Based on direct interviews with teachers, there are five main difficulties that become obstacles in the optimal utilization of this technology. The results of the difficulty analysis are presented in Table 1.

Tabel 1. Difficulties in Using *Smart Board* at SDN 2 Pilang Sari

No	Difficulty Category	Problem Description
1.	Teacher Competence	Some teachers do not understand how to use the smart board optimally.
2.	Limited Facilities	The *smart board* is only available in 1 unit for the whole school so it must be used alternately
3.	Supporting Infrastructure	The unavailability of school WiFi requires teachers to use personal hotspots which causes waste of internet data
4.	Limited Application Features	The only application available is YouTube with frequent advertising interruptions.
5.	Impact of Student Dependence	Students' dependence on interactive learning media, characterized by reluctance to learn without using a *smart board.*

1.2 Discussion and Solution

1.2.1 Teacher Competence in Using Smart Board

The first difficulty found was the lack of understanding of some teachers on how to use the smart board optimally. This causes the utilization of technology to be not optimal and hampers the learning process. This problem generally occurs with senior teachers who are less familiar with digital technology. The solution is can organize periodic and tiered training on the use of smart boards with materials tailored to the level of teacher understanding. Training can be divided into basic, intermediate and advanced levels (Ariani et al., 2022). In addition, a mentoring system can be established by teachers who are already proficient to those who are still struggling. Creating a simple and easy-to-understand smart board usage module can also help teachers learn the features independently. Schools can also invite technicians or technology education experts to provide practical workshops.

3.2.2 Limited Number of Smart Boards

The availability of only one smart board for the whole school requires teachers to use it interchangeably. This hinders the overall integration of technology in the learning process and creates gaps in students' learning experiences in different classes. It is can fix in the short term, creating a fair and structured smart board usage schedule can be a temporary solution. A scheduling system can be developed based on the prioritized needs of subjects and grade levels. For the medium term, schools can submit a proposal for procurement of additional

units to the Education Office or seek sponsorship from local companies through CSR programs. Another alternative is to develop a simple projection solution using more affordable projectors and laptops for other classes while waiting for the additional smart board units.

3.2.3 Internet Infrastructure Limitations

The unavailability of school WiFi requires teachers to use personal hotspots which results in wasted internet data. This creates an additional financial burden for teachers and hinders the sustainable use of technology in learning. Teacher can propose the procurement of school WiFi infrastructure to the education office or local government by including a needs and benefits analysis. As a temporary solution, schools can allocate a special budget to subsidize internet quota for teachers who use smart boards. Another alternative is to collaborate with internet service providers to get special education packages at affordable prices. For frequently used content, teachers can pre-download before learning to reduce data usage while teaching.

3.2.4 Application Feature Limitations and Advertisement Interruptions

The limitations of the newly available YouTube application features with frequent advertisement interruptions interfere with the smooth learning process. This reduces the effectiveness of learning time and can distract students. One of the solutions is teacher install learning apps that do not require internet connection such as GeoGebra for math, offline dictionary apps for languages, and other learning apps that can be downloaded for free. To overcome the distraction of advertisements, teachers can download the required learning videos before class starts or use learning platforms that offer ad-free versions such as YouTube Premium for Education. In addition, developing local digital learning content that can be accessed offline can also be a long-term solution.

3.2.5 Students' Dependence on Smart Board

Students dependence on smart board use is characterized by an unwillingness to learn with conventional methods after getting used to using interactive technology. This creates new challenges in managing student expectations and motivation (Davidovitch & Yavich, 2017). Teachers should implement a blended learning approach that balances the use of technology with conventional learning methods. Teachers need to design varied and engaging learning strategies even without using smart boards. Developing active learning activities such as educational games, group work and collaborative projects can be an interesting alternative. It is also important to educate students about the purpose of using technology in learning and foster the awareness that technology is a tool, not a substitute for the learning process.

3.3 Implications of Research Findings

The results of the analysis of the difficulties in using smart board at SDN 2 Pilang Sari show the need for a comprehensive approach in integrating technology into learning. This finding implies that the successful implementation of educational technology depends not only on the availability of devices, but also on the readiness of human resources, supporting infrastructure, and learning management strategies (Dasar, 2020). Schools need to develop a strategic plan for educational technology development that includes aspects of procuring facilities, improving teacher competence and developing learning methodologies that integrate technology appropriately . In addition, coordination and cooperation with various stakeholders, including the education office, local government and the private sector are needed to overcome the challenges faced. By implementing the Solutions, it is hoped that SDN 2 Pilang Sari can overcome the difficulties faced and optimize the use of smart board as an effective learning tool, thus improving the quality of education and students' learning experience.

4. CONCLUSION

This study reveals that the effective use of Smart Board in mathematics learning at SDN 2 Pilangsari depends not only on the availability of technology, but also on teacher readiness, supporting infrastructure and contextualized pedagogical strategies. The findings enrich the literature on educational technology integration by highlighting the complexity of implementation in rural primary schools, where challenges such as limited teacher training, internet infrastructure and students' dependence on technology emerge as critical factors. Theoretically, this study confirms the importance of a holistic approach to educational technology adoption that considers technical, human and contextual aspects (Karahan & Bozan, 2021).

Based on the findings, this study recommends the development of a sustainable and local needs-based teacher training framework and multi-stakeholder collaboration to strengthen digital infrastructure. However, this study has limitations in generalization due to the small sample coverage. Future research could expand the scope by involving more participants or test the effectiveness of the proposed mentoring model. The long-term implication is the need for school policies that not only focus on providing technology, but also on building

teacher capacity and continuous evaluation of its pedagogical impact. Thus, Smart Board optimization can contribute to sustainable and inclusive education transformation.

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