



## TECHNOLOGY-BASED SUPERVISION: OPTIMIZING THE ROLE OF SUPERVISION IN THE DIGITAL LEARNING ERA

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### **Abstract:**

This research aims to optimize the role of supervision in the era of technology-based digital learning. The object of this research is Technology-Based Supervision: Optimizing the Role of Supervision in the Digital Learning Era at SMA Darussalam Blokagung Banyuwangi East Java. In this research, the method used is qualitative with a case study approach to examine the effectiveness of technology-based supervision at SMA Darussalam Blokagung, Banyuwangi, East Java. The source of informants in this study consisted of the Quality Control Team (TPM), the principal, and teachers at SMA Darussalam Blokagung Banyuwangi, East Java. Data collection techniques in this study include observation, interviews, and documentation, which aim to gain a comprehensive understanding of the effectiveness of technology-based supervision at SMA Darussalam Blokagung Banyuwangi, East Java. Data analysis in this study used the data analysis model proposed by Miles and Huberman, which consists of three main steps: data reduction, data presentation, and conclusion drawing. The results of this study are the increased effectiveness of supervision through digital tools, the ability of supervisors to monitor the development of learning innovations globally and the improvement of teacher competence in technology through digital supervision.

**Keywords:** *Supervision, Digital Technology, Teaching.*

### **INTRODUCTION**

Technology-based supervision can improve the effectiveness of communication and feedback in learning, that the use of digital tools allows supervisors to be more responsive to teachers' needs, but still requires a personal approach to understand the context and challenges faced (Gigante & Zago, 2023); (Gorni et al., 2024); (Paksuniemi et al., 2021). Technology-based supervision enables faster and more effective communication between supervisors and teachers. Using digital platforms, supervisors can easily send messages, provide feedback and answer teachers' questions without having to wait for a face-to-face meeting. This increases responsiveness to teachers' needs in real time. A study published in the International Journal of Educational Technology showed that 80% of teachers reported increased responsiveness from supervisors when communicating through digital platforms (Nayak et al., 2022); (Zaki Ewiss, 2023); (SinitSYna, 2024). These results confirm that technology improves communication efficiency. Technology-based supervision improves communication efficiency between supervisors and teachers by enabling faster and more responsive interactions through digital platforms, with 80% of teachers reporting increased responsiveness from supervisors in these interactions.

Research on Technology-Based Supervision: Optimizing the Role of Supervision in the Digital Learning Era has been conducted by several researchers. (Cherni & Ben

Amar, 2024); (Liu et al., 2023); (Anwar & Saraih, 2024). With the increasing use of technology in education, there is an urgent need to understand how technology-based supervision can optimize the learning process. Research in this area helps explore new ways to improve the effectiveness of supervision and support to teachers in digital environments. Many recent studies published in international education journals, by (Liu et al., 2023); (Anwar & Saraih, 2024); (Pradana et al., 2024) show an increasing focus on technology-based supervision. This includes analyzing the various digital platforms used in the supervision process and their impact on teacher performance. With the increasing use of technology in education, research on technology-based supervision is increasingly important to explore new ways of improving the effectiveness of supervision and support to teachers, as shown by many publications in international education journals.

This research aims to optimize the role of supervision in the era of technology-based digital learning. With the rapid development of technology, traditional learning methods have changed, and education now increasingly relies on digital tools. This research aims to optimize the role of supervision to match these changes, ensuring that teaching and learning processes remain effective in a digital context. Research published in (Halagatti et al., 2023); (Osiesi et al., 2023); (Alhashem et al., 2022) suggests that technology-based supervision can improve teacher engagement and learning quality, with supervisors adapting to digital tools able to provide more effective support. With the rapid development of technology changing traditional learning methods, this research aims to optimize the role of supervision in a digital context, which is proven to improve teacher engagement and learning quality through more effective support from supervisors who adapt to digital tools.

Hypothesis of Technology-Based Supervision: Optimizing the Role of Supervision in the Digital Learning Era include Enhancing Supervision Effectiveness through Digital Tools, Supervisors' Ability to Monitor the Development of Learning Innovations Globally and Enhancing Teachers' Competence in Technology through Digital Supervision. Digital tools provide various features that allow supervisors to communicate and provide real-time feedback. This increases the effectiveness of supervision as supervisors can more quickly respond to teachers' needs and offer relevant support. Research published in (Martiniuk et al., 2022); (Rosa et al., 2024); (Xu et al., 2024) shows that the use of digital tools in supervision can improve communication effectiveness, with 75% of teachers reporting that they feel more supported after receiving feedback through digital platforms. The use of digital tools in supervision enables real-time communication and feedback, which improves the effectiveness of supervision by allowing supervisors to respond to teachers' needs more quickly, with 75% of teachers reporting feeling more supported after receiving feedback through digital platforms.

## **RESEARCH METHODS**

The object of this research is Technology-Based Supervision: Optimizing the Role of Supervision in the Digital Learning Era at SMA Darussalam Blokagung Banyuwangi East Java. The title "Technology-Based Supervision: Optimizing the Role of Supervision in the Digital Learning Era at SMA Darussalam Blokagung Banyuwangi East Java" was taken because the rapid development of technology has changed the way of learning and supervision in schools, especially at the high school level. This research aims to examine how the application of technology in supervision can improve the effectiveness of communication and support for teachers at SMA Darussalam, which is one of the educational institutions in Banyuwangi. By focusing on the local context, this research can provide relevant and applicable insights into effective supervision strategies in facing educational challenges in the digital era. In addition, the results of this study are expected to contribute to the development of better technology-based supervision practices in other schools in Indonesia.

In this research, the method used is qualitative with a case study approach to examine the effectiveness of technology-based supervision at SMA Darussalam

Blokagung, Banyuwangi, East Java. This approach allows researchers to explore in depth the experiences of teachers and supervisors in using digital tools in supervision practice. Data were collected through in-depth interviews with teachers and supervisors, direct observation of the supervision process, and analysis of relevant documents, such as training manuals and reports. By thematically analyzing the data, this study aims to identify the patterns and challenges faced, as well as the benefits of implementing technology-based supervision. The results are expected to provide a more comprehensive insight into supervision practices in the digital learning era and recommendations for better development in other schools.

The sources of informants in this study consist of the Quality Control Team (TPM), the principal and teachers at SMA Darussalam Blokagung Banyuwangi, East Java. The Quality Control Team plays an important role in providing insight into the policies and strategies implemented in technology-based supervision and its impact on the quality of education in the school. The principal as the leader of the institution has a broad perspective on the implementation of technology in the supervision process and can explain the challenges and successes experienced during the process. In addition, the teachers involved will provide in-depth information about their experiences in receiving technology-based supervision, including the benefits, constraints and how it affects their teaching. Through the combination of perspectives from these three sources, the research is expected to gain a comprehensive understanding of supervision practices in the digital learning era.

Table 1: research informants

No	Informants	Kode	Jenis Kelamin		Jumlah
			Man	Woman	
1	Quality control team SMADA	TPM	2		3
2	Leader SMADA	PIM	3		5
3	Teacher SMADA	GS	3		9
4	student SMADA	SM	4		6
<b>Total</b>					23

Data collection techniques in this study include observation, interviews and documentation, which aim to gain a comprehensive understanding of the effectiveness of technology-based supervision at SMA Darussalam Blokagung Banyuwangi, East Java. Observation was conducted by directly observing the supervision process, including the interaction between supervisors and teachers as well as the use of digital tools in learning activities. This allows the researcher to record the dynamics that occur in the field and provide a deeper context of supervision practices. Furthermore, semi-structured interviews were conducted with principals, members of the Quality Control Team (TPM) and teachers to explore their experiences, perceptions and challenges in implementing technology-based supervision. These interviews provided rich and in-depth qualitative data that is difficult to obtain through observation alone. Finally, documentation involves collecting and analyzing relevant documents, such as supervision guides, training reports and digital learning materials, which help researchers understand existing policies and practices. Through the combination of these three data collection techniques, the research is expected to present a comprehensive picture of the implementation of technology-based supervision in educational settings.

Data analysis in this research uses the data analysis model proposed by Miles and Huberman, which consists of three main steps: data reduction, data presentation, and drawing conclusions. First, data reduction is carried out by filtering and organizing

information obtained from interviews, observations and documents, so that only data that is relevant to the research question will be analyzed further. This process helped researchers to focus on important themes that emerged in technology-based supervision practices. Next, in the data presentation stage, the reduced information is arranged in the form of narratives, tables or graphs, making it easier for researchers to understand and analyze the data comprehensively. Finally, conclusions are drawn by identifying patterns, relationships and themes that emerge from the data, as well as formulating implications and recommendations based on these findings. Through this analytical model, this research seeks to provide a clear and in-depth picture of the effectiveness of technology-based supervision at SMA Darussalam.

## **RESULTS AND DISCUSSION**

### **Improving Supervision Effectiveness through Digital Tools**

The use of digital applications and platforms (such as Google Classroom, Microsoft Teams) increases the speed and accuracy of feedback (Papadakis, 2021); (Bouck et al., 2023); (Adi Badiozaman et al., 2022). Applications such as Google Classroom and Microsoft Teams allow teachers and supervisors to provide feedback directly. Through chat or comment features, teachers can get an immediate response without having to wait for a face-to-face meeting, thus accelerating the improvement cycle. Studies show that digital platforms increase the effectiveness of feedback in learning. Research from (Alhashem et al., 2022); (Fisher & Baird, 2020); (Marelli & Dello Sbarba, 2024) found that teachers who used digital platforms to receive feedback showed improvements in responsiveness and understanding of the feedback provided. Apps such as Google Classroom and Microsoft Teams accelerate the learning improvement cycle by enabling direct feedback between teachers and supervisors, which has been shown to increase teachers' responsiveness and understanding of the feedback received. "I find the application of digital tools very helpful, especially for getting guidance without having to meet face-to-face. Through digital tools, such as video conferencing platforms or LMS applications, I can more easily share materials or get feedback from supervisors. We also have more time freedom as feedback can be given asynchronously, so I can read and apply it after teaching", (GS).

Teachers interviewed revealed that the application of digital tools in supervision is very beneficial, especially because it allows for guidance without the need for face-to-face meetings. With digital tools, such as video conferencing platforms or learning management system (LMS) applications, teachers can interact more easily and share learning materials directly with supervisors. This allows teachers to receive quick and precise feedback or suggestions for improvement, which can be immediately implemented in the next learning session. Teachers also appreciate the time flexibility offered by digital supervision, as feedback can be given asynchronously. This means that teachers can read, understand and apply the feedback at a more flexible time, such as after teaching hours. With this method, teachers do not have to respond immediately during the supervision, so it does not disrupt their focus during the teaching process. The freedom to set the time to digest and apply this feedback, according to teachers, provides comfort and helps them to develop their teaching quality in accordance with the feedback provided.

Figure 1: Effectiveness of Darussalam High School Supervision



In an effort to improve the effectiveness of technology-based supervision, various collaboration and communication tools become very important to support interactions between supervisors, teachers and other education personnel such as slack, microsoft teams and zoom. Project management platforms such as Trello or Asana and Monday.com facilitate coordination, allowing teams to manage learning-related tasks in an organized manner, set deadlines and monitor the progress of each project transparently. In addition, digital learning and development platforms such as Google Classroom, Coursera For Business, LinkedIn Learning, moodle or Edmodo provide easy access for supervisors to observe the learning process, as well as provide training materials that can improve teacher competencies in digital-based teaching. To ensure supervision runs optimally and get input from all parties, survey and feedback platforms such as Google Forms or SurveyMonkey and Qualtrics are also very useful in collecting opinions and suggestions from teachers and employees. With these digital tools, supervision can be more collaborative, structured and responsive to the professional development needs of the educational environment.

In conclusion, the use of digital apps and platforms such as Google Classroom and Microsoft Teams accelerates the learning improvement cycle by providing immediate feedback that is proven to increase teacher responsiveness and understanding of feedback.

### **Supervisors' ability to monitor the development of learning innovations globally**

Technology enables supervisors to access and apply educational innovations from different parts of the world (Fisher & Baird, 2020); (Marelli & Dello Sbarba, 2024); (Caffrey et al., 2022). Technology enables supervisors to connect with global sources of educational innovation through platforms such as Google Scholar, Edutopia, or online communities such as LinkedIn and international education forums. This opens up access to the latest best practices and innovations developed in different countries, so supervisors can learn and apply them in the local context. Studies show that many schools in Indonesia have adopted STEM (Science, Technology, Engineering, and Mathematics) learning methods after accessing guidance and implementation results from other countries, such as Finland and the United States (Gerardou et al., 2022); (Dara & Kesavan, 2024); (Caffrey et al., 2024). Technology allows supervisors to access these reports and guides so that they can implement innovations that fit into the national curriculum. Technology gives supervisors access to global sources of educational innovation, allowing them to learn and apply best practices from different countries, such as the STEM learning methods adopted by many Indonesian schools based on international guidelines. "Teachers' responses vary. Some are very enthusiastic about new innovations, especially if they make teaching easier or improve interaction with students. However, there are also those who feel hesitant or unsure of its effectiveness. Therefore, I always make sure to provide training and support when implementing new innovations, so that they feel more prepared and motivated", (TPM).

The interviews show that teachers' responses to learning innovations vary. Some teachers are enthusiastic, especially if the innovation is proven to facilitate the teaching process or strengthen their interaction with students. Innovations that can ease the administrative burden, enrich learning methods or provide a more interactive learning

experience for students are generally well received. However, there are also teachers who feel hesitant or uncertain about the effectiveness of some of these innovations, perhaps due to the novelty factor or difficulty in adapting to new technologies. To overcome this obstacle, supervisors ensure that each innovation implementation is complemented by training and mentoring. This way, teachers can better understand how the innovations work and their benefits first-hand, so they feel more confident and ready to apply them in the teaching and learning process. This approach helps to motivate teachers to try new things and improve the overall quality of learning.

Figure 2: Learning Innovation Development



The figure explains that the development of learning innovations globally can make Supervisors' ability to monitor the development of learning innovations globally is an important skill to ensure that educational institutions can continue to adapt to trends and best practices in education. A competent educational supervisor needs to understand and keep up with changes in learning approaches, technologies and teaching methods that are constantly evolving around the world. This aims to improve the quality of education in the school or institution he or she supervises.

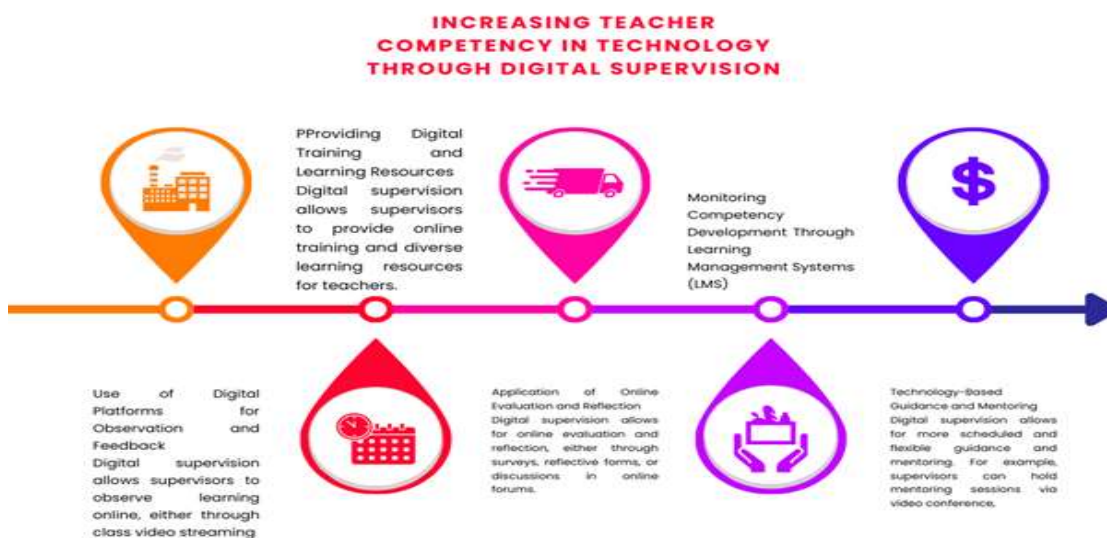
### **Improving Teacher Competence in Technology through Digital Supervision**

Supervisors can directly provide technology training to teachers, improving teachers' skills in using digital tools (Caffrey et al., 2024); (Gunarathna et al., 2024); (Batrakova et al., 2024). Using digital platforms, supervisors can provide technology training directly to teachers in the form of live sessions, tutorials or video demonstrations. This approach allows teachers to learn directly and interact with supervisors for clarification, which improves their understanding of digital tools. The use of digital platforms allows supervisors to provide technology training directly to teachers through live sessions, tutorials, and video demonstrations, which improves teachers' understanding of digital tools through direct interaction and clarification. "One of the main challenges is the technical readiness of the teachers themselves. Some teachers still feel unaccustomed to using digital platforms for supervision or training. I also need to ensure that they have adequate internet access to follow this process smoothly. Even so, I gradually see an improvement, especially once they get used to the platform we are using", (PIM).

Some teachers are not used to using digital platforms for supervision or training, which makes it take longer for them to adapt. Supervisors need to ensure that teachers have stable internet access so that the supervision process runs smoothly and effectively. Limited internet access is often an obstacle, especially when conducting online training or feedback that requires a connection either for video calls or accessing digital materials. However, supervisors noted an improvement over time; teachers began to feel more comfortable and were able to navigate the digital platform better after several exercises. As teachers become accustomed to the platform, the digital supervision process becomes more efficient, and teachers are also more prepared to utilize technology in their daily

learning.

Figure 3: Teacher Competence in Technology



The figure describes the competence of teachers who have Improving teachers' competence in technology through digital supervision is a strategic step to ensure teachers are able to integrate technology effectively in the learning process. Digital supervision allows supervisors to monitor, guide and evaluate teachers' ability to use learning technology in a more flexible and sustainable manner. Through this approach, teachers' competence in using technology can be improved gradually, so that they can provide more interactive and relevant learning experiences for students. Besides making it easier to monitor teachers' progress, digital supervision also creates an adaptive and collaborative learning culture, where teachers are always supported to explore new technologies and apply them in their learning.

## CONCLUSION

The importance of applying technology in the education supervision process to improve the quality of learning in the digital era. Technology-based supervision enables more efficient supervision and assessment and supports transparency and accountability. By utilizing technology, supervisors can monitor and provide precise and real-time feedback, helping teachers and educators develop digital skills and modern teaching strategies. In conclusion, technology-based supervision plays an important role in adapting the education process to the demands of the digital era and facilitating the continuous development of educators for more optimized learning.

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