

TEACHER PROFESSIONAL DEVELOPMENT AT MIN 2 BANTUL FOR THE IMPLEMENTATION OF TECHNOLOGY-BASED LEARNING

Akifatun Nafisah¹, Sularso²

^{1,2}PGSD FKIP Ahmad Dahlan University

2200005015@webmail.uad.ac.id¹, sularso@pgsd.uad.ac.id²

ABSTRACT

This study aims to examine the professional development of teachers at MIN 2 Bantul in the implementation of technology-based learning. With the advancement of technology, technology-based learning has become crucial in improving the quality of education. This study uses a qualitative approach with a case study method at MIN 2 Bantul. Data was collected through interviews, observations, and documentation. The results indicate that the professional development of teachers through technology training, both online and face-to-face, can enhance teachers' understanding of implementing technology in teaching. Despite challenges, such as limited infrastructure and teacher readiness, continuous development of competencies is being conducted to achieve more effective learning. The implementation of technology in the classroom also positively impacts student interaction and motivation to learn. The study concludes that continuous professional development of teachers is key to the successful implementation of technology-based learning in schools.

Keywords: professional development, teachers, technology-based learning, training, MIN 2 bantul

A. Introduction

Teacher professional development is an important aspect of improving the quality of education in Indonesia. One way to improve the quality of education is through the

application of technology-based learning. At MIN 2 Bantul, the application of technology in learning is still in the development stage, so more maximum efforts are needed. The purpose of this development is to

improve teachers' skills in utilizing technology in teaching and learning activities. Technology-based learning is believed to increase teaching effectiveness and enrich students' learning experience.

Technology provides many benefits in education, especially in improving teachers' digital literacy skills. Hayati et al. (2024) stated that TPACK-based learning media making training can improve teachers' digital literacy skills. Technology-integrated learning can make the learning process more interesting and effective, as it allows teachers to use a variety of digital tools and resources. It also optimizes student engagement in the learning process. Therefore, teachers' professional development in the application of technology is becoming increasingly important.

Despite the huge potential of technology in education, many teachers still struggle to integrate technology optimally in the learning process. Ardi and Perawironegoro (2024) note that limited understanding of the use of technology and inadequate facilities are the main obstacles. At MIN 2 Bantul, teachers

often face challenges in accessing and using technological devices that suit learning needs. Therefore, developing teachers' skills in utilizing technology is needed to support a better teaching and learning process.

One method that can be applied in improving teacher skills in the application of technology is the Project Based Learning (PBL) method. According to Amelia and Nugrahanta (2024), the PBL model can foster the character of social intelligence in students through project-based learning. By using this model, teachers can more easily integrate technology in the teaching and learning process, because students are given the opportunity to explore technology directly in the projects they work on. The application of the PBL method in the learning process can further enhance meaningful experiences and align with learning outcomes for students.

The implementation of technology-based learning also requires support from various parties, such as school principals and education supervisors. In this case, their support is crucial to provide

teachers with appropriate training and adequate resources. Munisah et al. (2024) showed that a learning management system utilizing technology is beneficial in improving learning quality and teacher performance. Policy support that supports the use of technology can make it easier for teachers to implement technology-based learning optimally.

Technology-based learning at MIN 2 Bantul has begun to be implemented, although it is still limited to a few subjects and a few teachers. Therefore, it is important for schools to conduct more structured professional development for all teachers. One of the steps that can be taken is to provide more intensive training related to the use of technology in learning. With proper training, teachers can be better prepared to implement technology in their daily learning.

In addition, teacher professional development must be accompanied by continuous evaluation to determine the extent of the success of the application of technology in learning. This evaluation can help analyze the obstacles that

may arise and can be used as a guide in finding solutions to overcome them. This study aims to analyze how teachers' professional development at MIN 2 Bantul can support the implementation of more effective technology-based learning. The results of this study are expected to provide recommendations for further improvement and development.

Technology-based learning not only improves the quality of learning, but also provides opportunities for teachers to be more innovative in managing the classroom. Fitriani et al. (2024) revealed that digital-based learning media development can assist teachers in explaining complex material in a way that is easier for students to understand. Therefore, developing technology skills for teachers is an important step in preparing them to face future educational challenges. Along with the rapid development of technology, it is important for teachers to keep learning and adjusting their teaching methods.

Therefore, MIN 2 Bantul needs to continue to strengthen teachers' professional development in the application of technology in learning.

By supporting the improvement of teachers' digital skills, it is expected to create a more dynamic and enjoyable learning environment for students. Technology-based learning will have a positive impact on students, especially in improving 21st century skills, such as digital skills, critical thinking and collaboration.

All parties involved in education, from the government, school principals, to the community, must be committed to creating an education ecosystem that supports technology.

This study aims to examine in depth how teacher professional development at MIN 2 Bantul can support the implementation of technology-based learning. By knowing the existing challenges and potentials, it is expected that strategic steps can be taken to improve the quality of learning in this school. The results of this study are also expected to be a reference for other schools that want to implement technology-based learning more effectively.

B. Research Methods

This research uses a qualitative method with a literature review approach to gain an in-depth understanding of the phenomenon being studied. The qualitative method was chosen because the main purpose of this research is to explore teachers' experiences, perspectives, and feelings in developing their professionalism. By using this approach, researchers can explore in more detail how teachers' professional development takes place more realistically, both in terms of the challenges and successes they experience. Through this method, researchers can also understand more clearly the factors that influence the process of teacher development. In addition, data collected from existing literature will provide a more comprehensive insight into the topic under study.

The selection of ScienceDirect as the main source of research data is based on its credibility as one of the leading scientific publishing platforms. This platform provides access to a variety of quality scientific journals, with peer-reviewed articles, which ensures the accuracy and quality of the information obtained. This

research focuses on journals published in the last five years to ensure that the data used is up-to-date and relevant to recent developments. The diversity of topics covered in these journals allows researchers to gain a variety of perspectives on teacher professional development in the technological era. Therefore, the researcher felt it was important to select sources that have a good reputation in the academic world..

In this study, researchers highlighted the importance of technology-based professional development in education. The use of technology in education is increasingly becoming an unavoidable necessity along with the rapid digital advancement. Teachers have a very crucial role in preparing students for the digital world, which requires not only technical knowledge, but also the ability to use technology in an effective learning process. Therefore, teachers' professional development should include understanding and applying technology in learning. This allows teachers to develop skills that are relevant to the needs of the times, as well as improve the quality of their teaching.

The literature review process conducted in this study included several structured stages. The first stage was the selection of relevant topics and keywords, such as "development", "professional", "technology", and "teacher". The selection of the right keywords is very important to ensure that the literature obtained really matches the focus of the research. After that, the researcher conducted a search through relevant databases, such as ScienceDirect, to identify articles that addressed the topic of interest. Each article found was then evaluated to ensure its relevance, credibility and quality before being used in this study.

Critical evaluation of the literature obtained is an important step in ensuring that the data used in the research can be justified. The researcher analyzed the methodology used in each study used as a reference to ensure that the approach applied is valid and can be applied in this study. In addition, the researcher also paid attention to the compatibility of the findings with the research objectives, to ensure that the information obtained could make a significant contribution to the

understanding of the topic being studied. The evaluation process also included an analysis of existing research gaps, which was then used to formulate more specific research directions. Thus, this evaluation stage helps the researcher to avoid mistakes in the selection of irrelevant or unqualified sources.

The literature review method in this study is not only used to collect data, but also to build a strong theoretical framework. This theoretical framework serves as the basis for understanding key concepts related to teacher professional development. In this case, the identified various relevant theories and models to support the understanding of how technology can be applied in professional development. In addition, the existing literature was used to map the relationships between variables involved in technology-based professional development, as well as to identify patterns and trends emerging from previous research. With a clear theoretical framework in place, researchers can produce stronger arguments that are grounded in existing research.

Through the process of synthesizing the literature, researchers can gain a broader understanding of the issue under study. This process allows researchers to see the relationship between variables in teacher professional development, especially in the application of technology. In addition, literature synthesis also helps researchers to formulate more solid conclusions about how professional development can be optimized through technology. By understanding existing patterns and trends, researchers can formulate more precise recommendations on how teacher professional development can be conducted more effectively. Therefore, this literature synthesis is an important stage in producing comprehensive research findings.

The literature review method also allows researchers to evaluate the contribution of previous research in this field. Researchers can see if there are previous studies that have addressed similar topics, as well as identify gaps or lacunae that exist in the research. This provides an opportunity for researchers to develop

further research by filling these gaps, or even to confirm the results of existing research. In addition, through evaluating the contributions of previous research, researchers can identify new approaches that can be applied in teacher professional development in the digital era. Thus, a literature review not only helps to collect data, but also to steer research in a more innovative direction.

In teacher professional development, the use of technology plays an important role in improving the quality of teaching. Technology allows teachers to access a richer and more diverse range of learning resources, which in turn can enrich students' learning experiences. In addition, technology also allows teachers to utilize more interactive and adaptive teaching methods, so as to meet the individual needs of students. With technology, the process of evaluating and assessing student progress can also be done more efficiently and accurately. Therefore, teachers' professional development in using technology can have a very positive impact on the overall quality of education.

This research also has important implications for education policy development. The results can provide policy makers with insights into the importance of technology-based professional development in the teacher training curriculum. By understanding the challenges and successes faced by teachers, the resulting policies can be more targeted and relevant to the needs in the field. In addition, this study also provides an overview of the potential use of technology to improve teaching quality, which can be used as a reference for the development of teacher training programs in the future. Thus, this research not only contributes to the academic field, but also provides practical benefits for the world of education as a whole.

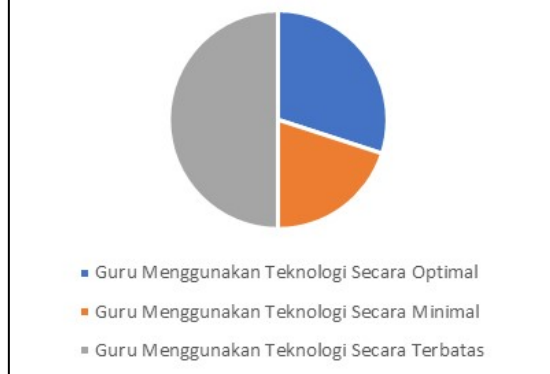
C. Research Results and Discussion

The results showed that teachers at MIN 2 Bantul showed significant progress in using technology in learning after attending the TPACK-based training. Most teachers reported that the training helped them to better understand how to integrate technology in their learning.

According to Hayati et al. (2024), TPACK-based training is very effective in improving teachers' digital literacy. Nevertheless, there are still some teachers who find it difficult to access the technological devices needed. The main obstacle found was the limited technology facilities at school. Some teachers complained about the lack of devices such as laptops, projectors and stable internet connections. As a solution, principals need to pay attention to procuring more adequate facilities to support technology-based learning. This is also in line with the findings of Munisah et al. (2024) who stated that adequate infrastructure is very important in supporting the application of technology in education. seen in the following summary table:

Grafik 1. Distribution of Technology Use in Learning by Teachers at MIN 2 Bantul

distribusi penggunaan teknologi dalam pembelajaran oleh guru di MIN 2 Bantul



The graph above illustrates the distribution of the use of technology in learning by teachers at MIN 2 Bantul. This graph shows that 30% of teachers use technology optimally, while 50% use technology limitedly, and the other 20% still use technology minimally. This is in line with the findings in the study which indicate a need for improvement in technology use skills among teachers.

Picture 1. Visualizing the impact of teachers' professional development on technology integration in learning

at MIN 2 Bantul



The figure above is an infographic that visualizes the key points of the research on the impact of teacher professional development on technology integration in learning at MIN 2 Bantul. These include elements such as the TPACK model, improved digital literacy, challenges such as limited access to technology, better infrastructure solutions, and the importance of leadership support and collaboration among teachers.

In terms of developing technology skills, most teachers felt that the training they received was helpful, although they need more intensive and continuous training. Many teachers expect further training to improve their skills in using various digital tools. This is in line with Ardi

and Perawironegoro's research (2024) which states that continuous training will increase the effectiveness of using technology in learning. From the observation, it was found that some teachers have started to integrate technology in their daily learning activities.

The use of learning applications and digital media makes learning more interesting and interactive for students. However, not all teachers use technology optimally. Some teachers still rely on traditional methods in teaching, although they have attended training on the use of technology. Overall, the results of this study show that teachers' professional development at MIN 2 Bantul has had a positive impact on the implementation of technology-based learning. However, there is still much that needs to be improved, especially related to the provision of adequate technology facilities and further training for teachers.

A more systematic strategy is needed in developing teachers' technological skills to improve the quality of learning in schools. This study also reveals that the support of school principals and education supervisors is crucial in the success of

teachers' professional development. Principals who support teachers' professional development by providing opportunities for training and providing the necessary facilities have a significant impact on the quality of technology-based learning.

This is also reinforced by Husamah's (2024) findings, which emphasize the important role of school leaders in the implementation of technology in learning. In addition, the results of this study show the importance of collaboration among teachers in sharing experiences and knowledge related to the use of technology in learning. This collaboration can accelerate the process of technology adaptation in schools.

More experienced teachers can provide guidance to other teachers who are just starting to use technology in teaching. The documentation shows that the training materials provided to teachers are very relevant to their needs in integrating technology. The materials cover the use of learning software and applications that can be accessed for free. In addition, the training also teaches how to use technology to increase student engagement in learning. However,

teachers still need time to adapt to the materials.

Based on these findings, it is important for schools to continuously improve technology facilities and training for teachers. Schools also need to provide adequate supporting facilities to ensure that teachers can access technology easily. Government support is also needed to ensure that every school has sufficient resources to implement technology-based teaching and learning to its full potential.

Overall, this study provides recommendations to continue to strengthen teachers' professional development at MIN 2 Bantul. This development should involve improved technology facilities, ongoing training and support from principals and education supervisors. With these measures, it is expected that technology-based learning can be effectively implemented to improve the quality of education in this school..

E. Conclusion

The conclusion of this study shows the results of teachers' professional development at MIN 2 Bantul is very important to improve the

quality of technology-based learning. Based on the literature review that has been conducted, continuous training and debriefing for teachers are the main factors that enable them to understand and utilize technology in the teaching and learning process.

The utilization of technology into the learning system, such as software training, online learning, and the application of interactive technology-based learning methods, has been proven to significantly improve the quality of teaching. Previous studies have also shown that the use of technology can enrich students' learning experience and encourage a more innovative learning environment.

Developing teachers' competencies through technology-based training not only results in improved teaching quality, but also contributes to increased student learning motivation. Several studies discussed in this literature review reveal that teachers' active involvement in the professional development process can improve their skills in creating an engaging and effective learning atmosphere.

However, the research also highlighted the challenges faced by many teachers in adopting technology, such as limited infrastructure and technology readiness in schools. These limitations are a major barrier to optimal technology adoption, requiring more systematic and planned solutions.

The literature analyzed in this study also indicates the importance of continuous support from schools and government to overcome these challenges. As explained in previous studies, policies that support teachers' professional development can have significant results in improving the quality of education. Therefore, to ensure the effective implementation of technology-based learning in the future, collaborative efforts between teachers, schools and the government are needed. All these parties should work together to provide the facilities and training needed for teachers to access and utilize technology optimally.

Through this literature review, it can be concluded that teacher professional development is key to

ensuring that technology can be properly applied in learning. Several development models that have been implemented in various schools show that approaches that focus on continuous training and in-depth understanding of technology provide better results. This research also confirms the importance of developing teachers' competence in information and communication technology as a means to improve teaching quality and enrich students' learning experience.

The successful application of technology in learning, as discussed in the studies reviewed in this research, is highly dependent on the active involvement of all parties involved in education. Close collaboration between teachers, school authorities and government is necessary to create a supportive environment for teachers' professional development. In many studies, it was noted that support from school leaders and supportive policies are very influential in the successful implementation of technology in the teaching and learning process..

This conclusion is also in line with findings in the literature that suggest

that teacher professional development should be conducted on an ongoing basis, with particular attention to technological readiness and available infrastructure.

Many studies have shown that these factors are important elements in ensuring that teachers can utilize technology effectively. Therefore, this study emphasizes the importance of careful planning and consistent support from various parties for teachers' professional development to run smoothly and have a positive impact on the quality of education.

This research also reveals that technology is not only a tool in the learning process, but also serves as a catalyst for improving the overall quality of education. The reviewed literature shows that technology can

improve the interaction between teachers and students, as well as enable the use of more interesting and varied learning resources. Therefore, effective application of technology can create a learning environment that is more dynamic and responsive to students' needs.

The results of this study support the importance of teachers' professional development as a strategic step to face the challenges of technology-based learning in the future. The successful implementation of technology at MIN 2 Bantul shows that appropriate training and ongoing support can improve teachers' competence in using technology effectively. In this regard, this study provides strong evidence that teacher professional development is an important investment in improving the quality of education in the digital era.

This research also shows that the implementation of technology-based learning requires continuous adaptation, as the technology itself develops. Therefore, it is important for all parties involved to continuously update relevant knowledge and skills, as well as create policies that support the implementation of technology to the fullest.

As such, teacher professional development is not just about improving competencies, but also about preparing them to face the challenges and opportunities that exist

in the ever-evolving world of digital education.

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