p-ISSN: 2089-8444 *e*–ISSN: 2964-7355
Volume 13 | Nomor 3 | Oktober 2024

Improving Teachers' Professional Competence through Technology Implementation for Education Quality Improvement in Mamasa District

Fredy Pawan[1], Dina Gasong[2], Rita Tanduk[3]
[1,2,3] *Universitas Kristen Indonesia Toraja*
fredypawan7@gmail.com[1], dinagasong@ukitoraja.ac.id[2], ritatanduk@ukitoraja.ac.id[3]

Abstract
Teachers have a strategic role in improving the quality of education, especially in developing professional competencies that include mastery of material, learning strategies, and utilization of educational technology. This study aims to analyze the effect of educational technology implementation on improving teachers' professional competence in order to improve the quality of education in Mamasa district. This research uses a mixed methods approach, where qualitative methods are used to describe the implementation of educational technology in the learning process, while quantitative methods are used to analyze the relationship between teachers' professional competence and student achievement through data presented in the form of numbers and tables. The results show that teachers who implement educational technology in learning tend to have more effective teaching methods, increase student engagement and contribute to improved learning outcomes. However, there are still constraints in teachers' access to technology and digital literacy that need further attention. With continuous training and mentoring, the implementation of education technology can be a solution to improve teachers' professional competence and the overall quality of education in Mamasa district.

Keywords: *Teacher professional competence, education technology, education quality.*

Introduction

Education is one of the main pillars in building a smart and competitive nation. This is in line with the national vision stated in the 1945 Constitution which states that one of the main objectives of the state is to educate the nation's life. In realizing this vision, teachers have a very important role as educators who are responsible for forming quality students (Khotimah, Husnul; Astuti, Eka Yuli; Apriani, 2019). The success of the education system is highly dependent on the professional competence of teachers in carrying out their duties.

Teachers' professional competence includes mastery of teaching materials, selection of effective learning methods, and the ability to utilize educational technology in the learning process (Fitriyadi, 2013; Setiarsih, 2017). Improving the quality of education cannot be separated from the role of teachers in implementing learning strategies that are innovative and in accordance with the times. Therefore, the development of teachers' professional competence is a crucial factor in efforts to improve the quality of education, especially in areas such as Mamasa district. In Mamasa district, especially at SDN 005 Pambe in Sesenapadang sub-district, the challenges in improving the quality of education are still quite complex. The lack of educators who have adequate professional competence, limited educational facilities and infrastructure, and the lack of utilization of technology in the learning process are some of the main obstacles faced. Teachers as the spearhead of education must be able to adapt to technological developments in order to improve the effectiveness of learning and student learning outcomes.

In the education system, there are four main competencies that must be possessed by a teacher, namely professional competence, pedagogical competence, social competence, and personality competence (Gravett et al., 2021; Pirdaos, 2015). Of the four competencies, professional competence is the main factor that determines the success of the learning process. Teachers' professional competence not only includes mastery of teaching materials, but also the ability to manage classes, apply varied learning methods, and utilize educational technology to support teaching and learning activities.

Various studies show that the use of educational technology can help improve teachers' professional competence and learning effectiveness. Educational technology allows teachers to access wider learning resources, develop more interactive learning materials, and manage learning more efficiently. The use of Learning Management System (LMS) (Morze et al., 2021), digital learning media and other technology-based applications can increase students' engagement in the learning process and help them understand the material better. However, the implementation of educational technology at SDN 005 Pambe still faces various obstacles. One of the main challenges is the low level of digital literacy among teachers, so they have not been able to fully utilize technology optimally in learning. In addition, limited technological infrastructure such as uneven internet access and lack of supporting facilities are also obstacles in the implementation of educational technology in this school. Therefore, there needs to be a systematic and sustainable strategy to improve teachers' professional competence through the utilization of educational technology.

Improving teachers' professional competence can be done through various training and mentoring programs that focus on the use of technology in learning. The government and educational institutions need to provide relevant and practice-based training to teachers so that they can develop skills in utilizing educational technology. In addition, collaboration between schools, government and communities is also an important factor in creating a conducive learning environment that supports teachers' professional development. This study aims to analyze the extent to which teachers' professional competencies contribute to improving the quality of education at SDN 005 Pambe and how the implementation of educational technology can strengthen teachers' professionalism in the learning process. Using a mixed methods approach, this study combined qualitative and quantitative methods to gain a comprehensive picture of the relationship between teachers' professional competence and education quality. Data were collected through observation, interviews, documentation studies, and questionnaires distributed to teachers and students.

Based on the results of the research, around 63% of teaching staff at SDN 005 Pambe have met the professional competency standards in carrying out their duties. However, there are still some challenges that need to be overcome, such as the lack of professionally certified educators, limited educational facilities, and the lack of technology utilization in learning. Therefore, allocating additional educators who have qualifications according to school needs is an important step in improving the quality of education in this region. In addition, awareness of the importance of teachers' professionalism and competence in supporting the quality of education also needs to be improved (Olszewski & Crompton, 2020). Teachers must have the initiative to continue developing themselves through training and mastering educational technology in order to provide a better learning experience for students. The government and related parties also need to play an active role in providing support both in the form of policies and the provision of adequate facilities.

With continuous efforts to improve teachers' professional competence and more optimal implementation of educational technology, it is hoped that the quality of education at SDN 005 Pambe can improve significantly. This research is expected to contribute to the development of strategies to improve the quality of education, especially in the context of schools in remote areas such as Mamasa district. Thus, the national vision in educating the nation's life can be realized through a higher quality and competitive education system.

Research Methods

This research uses a mixed methods approach, which is a combination of qualitative and quantitative methods to obtain more comprehensive data. The qualitative approach was used to

deeply understand the implementation of educational technology in improving teachers' professional competence, while the quantitative approach was used to analyze the relationship between teachers' professional competence and education quality based on measurable data. Data were collected through observations, interviews, documentation studies, and distributing questionnaires to teachers and students at SDN 005 Pambe. Observations were made to directly observe the learning practices implemented by teachers and how they utilize technology in the teaching and learning process. Interviews were conducted with teachers, principals and education personnel to gain insight into the constraints and efforts made in improving teachers' professional competence.

Questionnaires were used to measure the level of teachers' professional competence and the effectiveness of educational technology implementation. The quantitative data obtained was analyzed using descriptive statistical techniques to see the pattern of relationships between the variables studied. Meanwhile, qualitative data analysis was carried out using data reduction techniques, data presentation, and conclusion drawing. With this approach, the research is expected to provide a clearer picture of the role of educational technology in improving teachers' professional competence and its contribution to the quality of education at SDN 005 Pambe.

The data obtained were analyzed using Miles and Huberman's qualitative data analysis technique, which consists of three main stages:

1. Data Reduction: The data that had been collected were selected, simplified, and categorized according to the focus of the research.
2. Data Presentation: Data is organized in the form of narrative descriptions, tables, and interview quotes to make it easier to understand.
3. Conclusion Drawing: Conclusions are made based on the results of data analysis to answer research questions and provide recommendations related to the utilization of serial drawing media in learning to write narratives.

Results and Discussion

Result

A. Implementation of technology in improving teachers' professional competence at SDN 005 Pambe, Mamasa Regency

The results show that the implementation of educational technology has a significant positive impact on improving teachers' professional competence at SDN 005 Pambe. Teachers who have received training in the use of technology show improvements in various aspects of learning, including:

1. More effective delivery of material
   Teachers who utilize technology in learning can deliver material more interestingly and easily understood by students. The use of digital media such as interactive presentations, learning videos, and internet-based educational applications help improve students' understanding of the material taught.
2. Better Classroom Management
   Technology also helps teachers to manage the classroom more effectively. With digital learning platforms, teachers can give assignments and evaluations in a more structured manner, as well as monitor student progress in real-time.
3. Increased Student Engagement
   Students become more active in discussions and more motivated to learn when technology is applied in learning. The interactive learning environment creates a more

enjoyable learning experience and makes it easier for students to understand the concepts taught.

4. Use of Various Learning Resources
   Technology allows teachers to access various learning resources online. This enriches teachers' horizons and allows them to develop more innovative teaching materials that suit students' needs.
5. Improving Teachers' Skills in Using Technology
   Teachers who have received training in the use of technology show improved skills in operating technological devices, utilizing learning applications, and integrating various media in the teaching process.
6. Increased Efficiency in Preparation of Teaching Materials
   Technology helps teachers to organize teaching materials more efficiently. Various digital tools such as word processing, presentation and graphic design software allow teachers to create more attractive teaching materials in less time.

More Effective Delivery of Materials Teachers who utilize technology in learning can deliver materials more interestingly and easily understood by students. The use of digital media such as interactive presentations, learning videos, and internet-based educational applications help improve students' understanding of the material being taught. Better Classroom Management Technology also helps teachers manage the classroom more effectively. With digital learning platforms, teachers can give assignments and evaluations in a more structured manner, as well as monitor student progress in real-time. Increased Student Engagement Students become more active in discussions and more motivated to learn when technology is applied in learning. The interactive learning environment creates a more enjoyable learning experience and makes it easier for students to understand the concepts taught.

B. Challenges faced by teachers in adopting technology in the learning process

Although the implementation of educational technology brings many benefits, there are still some challenges faced in its application, among others:

1. Limitations of Technology Infrastructure

   One of the main obstacles faced in the implementation of educational technology in Mamasa district is the limited technology infrastructure in schools. Not all classrooms are equipped with adequate devices, such as computers, projectors or stable internet access. This makes it difficult for teachers to integrate technology into learning optimally. Some schools only have limited technology facilities that must be used interchangeably by many teachers and students. As a result, the utilization of technology in the teaching-learning process is less than optimal. In addition, the geographical condition of Mamasa Regency, which is dominated by mountainous areas, also contributes to the limited infrastructure. Difficult transportation has hampered the delivery of technology devices to schools. Without adequate infrastructure support, the use of technology in education is far from optimal.
2. Lack of in-depth training for teachers

   Another factor is the lack of in-depth training for teachers in the use of educational technology. Although some teachers have attended basic training related to the use of technological devices, many of them still feel less confident in implementing them in learning. The lack of training makes it difficult for teachers to make the most of technology to improve student interaction and understanding. The training provided so far is often one-time or unsustainable, so it does not have a significant impact on teachers' skills in adopting technology. Without ongoing mentoring, many teachers

revert to conventional teaching methods that they find easier and more familiar. Therefore, a more intensive and sustainable training program is needed so that teachers can master various technology-based learning techniques more effectively.

3. Uneven Internet Access

Uneven internet access is a major challenge in implementing educational technology in Mamasa district. Unstable or even unavailable internet connections in some areas make it difficult for teachers to utilize online learning platforms or other digital education resources. In fact, access to the internet is very important in supporting the use of technology in learning, such as searching for teaching materials, using educational applications, and communicating with fellow educators or experts. Many schools in remote areas only rely on weak internet connections, so teachers cannot maximally utilize the available digital resources. In addition, the high cost of internet access is also an obstacle for teachers and students in accessing online learning materials outside of school. Without stable and affordable internet access, the utilization of technology in education is still limited and less effective. To overcome this obstacle, cooperation between the government, internet service providers and other related parties is needed to improve network infrastructure in areas that still have limited access. With a stable and widespread internet connection, the utilization of technology in education can run more optimally.

C. Strategy for Optimizing the Implementation of Educational Technology

In order to maximize the benefits of technology in learning, the following strategies can be implemented:

1. Continuous Training for Teachers

In order for the implementation of technology in learning to run effectively, teachers need to get more in-depth and continuous training. This training not only includes an introduction to various technological devices, but also strategies for using them in teaching. With continuous training, teachers will be more familiar and confident in integrating technology into the learning process. In addition, hands-on training will help teachers understand how to optimally utilize technology to improve student interaction and understanding.

2. School Infrastructure Improvement

One of the main challenges in implementing technology in education is limited infrastructure. Many schools in remote areas, including in Mamasa district, still face constraints in the availability of technology devices such as computers, projectors and stable internet access. Therefore, the government and related parties need to work on improving school infrastructure by providing adequate devices and improving internet access. With adequate infrastructure, teachers can more freely utilize technology to support learning activities.

3. Collaboration between Schools and Related Parties

To support the implementation of educational technology, collaboration between schools and various parties such as universities, training institutions, and technology companies is needed. Universities can play a role in providing mentoring and training for teachers, while training institutions can provide technology-based modules and curricula that suit educational needs. In addition, technology companies can also contribute by providing educational devices and applications that can be used in learning. This collaboration will open up more opportunities for teachers to get better resources to improve their skills in using technology.

Discussion

The results show that the implementation of educational technology has a significant positive impact on improving teachers' professional competence at SDN 005 Pambe. Teachers who had received training in the use of technology showed improvements in various aspects of learning. One of the main benefits of technology implementation is more effective delivery of materials (Pratama, Ruruk, et al., 2023; Pratama, Sampelolo, et al., 2023). Teachers can deliver material in a more interesting and understandable way to students through the use of digital media such as interactive presentations, learning videos and internet-based educational applications. This helps improve students' understanding of the material being taught and makes the learning process more enjoyable.

In addition, technology also supports better classroom management (H. et al., 2021). With a digital learning platform, teachers can give assignments and evaluations in a more structured manner, and monitor students' progress in real-time. This allows teachers to provide faster and more targeted feedback, making the learning process more effective and efficient. Students are also more active in discussions and more motivated to learn when technology is applied in learning. The interactive learning environment creates a more engaging learning experience and makes it easier for students to understand the concepts being taught. However, although the implementation of educational technology brings many benefits, there are still some challenges faced in its implementation. One of the main obstacles is the limited technology infrastructure in schools (Darwanto et al., 2021; Pratama & Adam, 2024). Not all classrooms are equipped with adequate technological devices, such as computers, projectors or stable internet access. This makes it difficult for teachers to integrate technology into learning optimally. In addition, the geographical condition of Mamasa Regency, which is dominated by mountainous areas, also contributes to the limited infrastructure, resulting in uneven access to technology.

The lack of in-depth training for teachers is also a challenge in implementing educational technology. Although some teachers have attended basic training related to the use of technological devices, many of them still feel less confident in implementing them in learning. The lack of ongoing training makes it difficult for teachers to utilize technology to its full potential. Therefore, a more intensive and continuous training program is needed so that teachers can master various technology-based learning techniques more effectively.

In addition, unequal internet access is a major challenge in implementing educational technology in Mamasa district. Unstable or even unavailable internet connections in some areas make it difficult for teachers to utilize online learning platforms or other digital education resources. In fact, access to the internet is very important in supporting the use of technology in learning, such as searching for teaching materials, using educational applications, and communicating with fellow educators or experts. To optimize the implementation of technology in learning, several strategies are needed. One of them is continuous training for teachers (Ervianti et al., 2023). With continuous training, teachers will be more familiar and confident in integrating technology into the learning process. In addition, improving school infrastructure is an urgent thing to do. The government and related parties need to make efforts to provide adequate devices and improve internet access so that technology can be optimally utilized in learning activities.

Collaboration between schools and various parties is also an important step in supporting the implementation of educational technology (Chen & Tsai, 2021; Tang, 2019). Universities can play a role in providing mentoring and training for teachers, while training institutions can provide technology-based modules and curricula that suit educational needs. In addition, technology companies can also contribute by providing educational devices and applications that can be used in learning. With strong collaboration between various parties, the utilization of technology

in education can be maximized. The preparation of a technology-based curriculum also needs to be considered so that the utilization of technology in learning can run effectively and systematically. A well-designed curriculum will ensure that technology is used as a learning tool that supports the achievement of students' academic competencies. Thus, the integration of technology in education is not just a trend, but also part of efforts to improve the overall quality of education.

Conclusion

This research shows that the implementation of technology in learning has a positive impact on improving teachers' professional competence at SDN 005 Pambe, Mamasa Regency. Teachers who have received training and actively use technology in learning show improvements in material delivery, classroom management, and student engagement in the learning process. However, there are still some obstacles to overcome, such as limited technology infrastructure, lack of in-depth training for teachers, and uneven internet access. Therefore, joint efforts from the government, schools and related parties are needed to optimize the implementation of technology in education.

This study shows that the implementation of educational technology has a positive impact on improving teachers' professional competence at SDN 005 Pambe, Mamasa district. Teachers who had received training in the use of technology showed improvements in various aspects of learning, including more effective delivery of materials, better classroom management and increased student engagement in learning. However, there are still some obstacles to overcome, such as limited technology infrastructure, lack of in-depth training for teachers, and uneven internet access.

To overcome these obstacles, concerted efforts are needed from the government, schools and other related parties. Continuous training for teachers, improvement of school infrastructure, and collaboration between various parties are strategic steps that can be implemented to optimize the use of technology in education. With strong support from various parties, the implementation of educational technology can run more effectively and provide maximum benefits for improving the quality of education in Mamasa district.

References

Chen, C. H., & Tsai, C. C. (2021). In-service teachers' conceptions of mobile technology-integrated instruction: Tendency towards student-centered learning. *Computers and Education*, *170*(August 2020), 104224. https://doi.org/10.1016/j.compedu.2021.104224

Darwanto, Khasanah, M., & Putri, A. M. (2021). Strengthening Literacy, Numeracy, and Technology Adaptation in School Learning (An Effort to Face the Digital Era and Disruption. *Eksponential Journal*, *11*(2), 26–35.

Ervianti, E., Sampelolo, R., & Pratama, Muh. P. (2023). the Influence of Digital Literacy on Student Learning. *Klasikal : Journal of Education, Language Teaching and Science*, *5*(2), 358–365. https://doi.org/10.52208/klasikal.v5i2.878

Fitriyadi, H. (2013). Integrasi Teknologi Informasi Komunikasi Dalam Pendidikan: Potensi Manfaat, Masyarakat Berbasis Pengetahuan, Pendidikan Nilai, Strategi Implementasi Dan Pengembangan Profesional. *Jurnal Pendidikan Teknologi Dan Kejuruan*, *21*(3), 269–284.

Gravett, K., Taylor, C. A., & Fairchild, N. (2021). Pedagogies of mattering: re-conceptualising relational pedagogies in higher education. *Teaching in Higher Education*. https://doi.org/10.1080/13562517.2021.1989580

H., N., Gani, H. A., Pratama, Muh. P., & Wijaya, H. (2021). Development of an Android-based Computer Based Test (CBT) In Middle School. *Journal of Education Technology*, *5*(2), 272–281. https://doi.org/10.23887/jet.v5i2.33527

Khotimah, Husnul; Astuti, Eka Yuli; Apriani, D. (2019). Pendidikan Berbasis Teknologi (Permasalahan Dan Tantangan). *Prosiding Seminar Nasional Pendidikan Program Pascasarjana Universitas Pgri Palembang*, 357–368.

Morze, N., Varchenko-Trotsenko, L., Terletska, T., & Smyrnova-Trybulska, E. (2021). Implementation of adaptive learning at higher education institutions by means of Moodle LMS. *Journal of Physics: Conference Series*, *1840*(1). https://doi.org/10.1088/1742-6596/1840/1/012062

Olszewski, B., & Crompton, H. (2020). Educational technology conditions to support the development of digital age skills. *Computers and Education*, *150*(November 2019), 103849. https://doi.org/10.1016/j.compedu.2020.103849

Pirdaos, R. (2015). Orientasi Pedagogik dan Perubahan Sosial Budaya Terhadap Kemajuan Ilmu Pendidikan dan Teknologi. : *: Jurnal Pendidikan Islam*, *6*.

Pratama, Muh. P., & Adam, Muh. W. S. (2024). *E-books as self-learning resources for educational technology students*. *13*(1), 9–15. https://doi.org/doi.org/10.26618/jkm.v13i1.14265

Pratama, Muh. P., Ruruk, S., & Karuru, P. (2023). Validity of interactive learning media in computer basics course. *Jurnal Inovasi Teknologi Pendidikan*, *10*(4), 353–362. https://doi.org/10.21831/jitp.v10i4.60376

Pratama, Muh. P., Sampelolo, R., & Lura, H. (2023). REVOLUTIONIZING EDUCATION: HARNESSING THE POWER OF ARTIFICIAL INTELLIGENCE FOR PERSONALIZED LEARNING. *Klasikal: Journal of Education, Language Teaching and Science*, *5*(2), 350–357. https://doi.org/10.1007/978-3-031-08250-4_25

Setiarsih, A. (2017). DISKURSUS PENDIDIKAN KRITIS (CRITICAL PEDAGOGY) DALAM KAJIAN PENDIDIKAN KEWARGANEGARAAN. *Citizenship Jurnal Pancasila Dan Kewarganegaraan*, *5*(2). https://doi.org/10.25273/citizenship.v5i2.1310

Tang, Y. (2019). Voicethread: Utilization of technology for library instruction. *International Journal of Online Pedagogy and Course Design*, *9*(4). https://doi.org/10.4018/IJOPCD.2019100105