Computer System Implementation on Teacher Performance in Elementary Schools

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Abstract: This study analyzes the impact of computer system implementation on teacher performance in elementary schools using a qualitative approach. Data were collected through in-depth interviews with 15 teachers, participatory observation, and analysis of school policy documents. The findings indicate that computer systems enhance administrative efficiency and foster collaboration among teachers, although challenges such as technological competency gaps and limited infrastructure persist. The study identifies three main themes: time optimization, improved data accuracy, and the dynamics of technological adaptation. These findings highlight the need for ongoing training and infrastructure support to maximize the benefits of computer systems in primary education environments.

1. Introduction

The development of information technology has driven the transformation of the education management system, including in elementary schools. The implementation of computer systems is believed to improve teacher performance through automation of administrative tasks and

strengthening collaboration. However, previous studies have focused more on quantitative approaches [1], while qualitative aspects such as teacher perceptions and implementation dynamics are still under-explored. This study aims to:

a. Analyzing the impact of implementing computer systems on teacher work effectiveness

b. Identifying supporting and inhibiting factors in technology adoption

c. Recommending an adaptive computer system implementation model for elementary schools

In today's digital era, the development of information technology has had a significant impact on various sectors of life, including education. One form of this development is the application of computer systems in various educational activities, both in the administration process and learning activities. The use of computer systems is considered capable of increasing work efficiency and effectiveness, including in supporting the performance of educators in elementary schools. According to Riyanto (2010), computer technology in education can provide ease in accessing information, accelerate data processing, and support learning management more effectively.
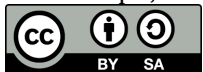
Teachers as the spearhead in the implementation of the teaching and learning process are required to be able to adapt to technological advances. The use of computer systems allows teachers to more easily compile learning tools, manage grades, create reports, and conduct digital-based learning evaluations. Sadiman (2011) stated that technology, especially computers, plays a role as a tool that can improve the quality and productivity of teachers in carrying out their duties in the classroom. This shows that mastery of computer technology is no longer an option, but a necessity that must be met by every educator.

However, in practice, the implementation of computer systems in elementary schools does not always run smoothly. There are various factors that influence the success of implementing this technology, such as the availability of infrastructure, the level of digital literacy of teachers, technical training, and support from school management. According to Munir (2012), the success of technology integration in education is largely determined by the readiness of the human resources who manage it, including in this case the competence of teachers in using computers to support their professional duties.

The importance of implementing computer systems in improving teacher performance makes this issue relevant to be studied in depth, especially through a qualitative approach that is able to explore the views, experiences, and obstacles experienced by teachers directly. Through this approach, it is hoped that a more holistic picture can be obtained regarding how computer systems are applied in the context of teachers' daily work in elementary school environments. As stated by Moleong (2017), qualitative research aims to understand phenomena in depth from the perspective of participants.

This study not only aims to understand the benefits of implementing a computer system for teachers, but also wants to identify supporting and inhibiting factors in its implementation. Thus, the results of this study are expected to be a reference for schools, education offices , and other policy makers in designing strategies to increase teacher capacity and improve educational technology support systems. Uno (2012) emphasized that improving teacher performance can be achieved through the provision of adequate facilities, ongoing training, and the use of appropriate technology media.

Based on this background, this study carries the title "Analysis of Computer System Implementation on Teacher Performance in Elementary Schools" which focuses on finding out to what extent computer systems have been implemented by teachers, their impact on their performance, and the obstacles faced in their implementation. This study also aims to provide practical recommendations to improve the effectiveness of computer system use in elementary education environments.

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2. Tinjauan Literatur

2.1. Computer Technology in the World of Education

The development of computer technology has driven a transformation in the world of education, especially in increasing the efficiency of teacher work. Computers are used to compile teaching materials, manage grades, compile reports, and create interactive learning media (Riyanto, 2010; Sadiman et al., 2011). Computer technology also increases the flexibility of learning through online platforms and digital applications (Munir, 2012).

2.2 Impact of Computer System Implementation on Teacher Performance

The implementation of computer systems has been proven to increase the effectiveness and efficiency of teacher performance. Teachers are able to save time in preparing lesson plans and assessments, as well as improve the quality of teaching materials through the use of digital media (Sagala, 2009; Uno, 2012). In addition, the integration of computers with the curriculum, such as the Merdeka Curriculum, allows for more contextual and student-centered learning (Munir, 2012; Daryanto & Karim, 2017).

2.3 Digital Literacy and Teacher Competence

One of the important factors in the successful implementation of a computer system is the digital literacy of teachers. Teachers with good technological skills adapt more quickly and show high productivity in carrying out their duties (Nasution, 2008; Wahyuni, 2019). For this reason, continuous training is needed so that teacher competence can continue to be improved (Susanto, 2021).

2.4 Inhibiting Factors in the Implementation of Technology

Some challenges that often arise are limited technological facilities, lack of training, and competency gaps between teachers. Teachers who are not used to using computers have difficulty operating online assessment or learning applications (Moleong, 2017; Purwanto, 2013). In addition, digital culture in the school environment also influences the success of technology integration (Sanjaya, 2010).

2.5 School Management and Collaborative Culture

The success of computer systems in supporting teacher performance is largely determined by managerial support from the school. Schools that provide training, facilitate technological devices, and build a collaborative culture between teachers can accelerate the adaptation of technology (Yusuf, 2014; Arifin, 2018). Collaboration and sharing of skills between teachers strengthen the professional learning community in the elementary school environment.

3. Research Methods

This study uses a descriptive qualitative approach that aims to describe and analyze in depth the application of computer systems to teacher performance in elementary schools. This approach was chosen because it is appropriate for studying subjective and complex phenomena, such as teachers' experiences and perceptions in using technology. According to Moleong (2017), a qualitative approach allows researchers to understand the meaning behind the behavior, experiences, and social interactions of research subjects holistically.

The subjects of the study were several teachers who had used computer systems in learning and administration activities. The data collection technique was carried out by purposive sampling, namely selecting informants based on certain criteria, such as experience in using computers and willingness to be interviewed. Data collection techniques included in-depth interviews, direct observation, and documentation of teacher activities related to the implementation of computer systems.

The data obtained were analyzed using the Miles and Huberman model, which includes three stages, namely data reduction, data presentation, and drawing conclusions. To ensure the validity of the data, the researcher used source and technique triangulation techniques, and conducted reconfirmation (member check) with informants. Through this method, it is hoped that the results of the study will be able to provide a real picture of the extent to which the computer system affects teacher performance and the factors that support and hinder its implementation.

4. Results And Discussion

The results of the study showed that most teachers in Elementary Schools have used computer systems in learning and administration activities. The use of computers is carried out in various forms, such as compiling Learning Implementation Plans (RPP), creating evaluation questions, processing student grades, and compiling learning reports. Teachers stated that the computer system greatly helped them in completing these tasks more quickly, neatly, and efficiently. This indicates that computer technology has become an integral part of teachers' work routines in supporting the implementation of their professional duties.

From the results of in-depth interviews, information was obtained that easy access to computer devices and the availability of internet connections are two main supporting factors in the success of implementing digital-based tasks. Teachers who have personal devices such as laptops or computers at home tend to be more accustomed and confident in using technology in their work. On the other hand, some teachers experience obstacles due to limited facilities at school and lack of skills in operating certain programs, such as Microsoft Excel and e-report applications which are basic needs in reporting learning.

Observations made during the research process showed that teachers with high levels of digital literacy were more productive and efficient in their work. They were able to integrate computer technology into the learning process, such as creating interactive learning media, using learning videos, and utilizing online assessment applications. In contrast, teachers who were not yet familiar with technology still tended to use manual methods that took longer. This shows a digital skills gap among teachers that requires serious attention from the school.

In this context, Purwanto's opinion (2013) strengthens the finding that information and communication technology is very important in improving teacher work efficiency. He stated that technology can support the effectiveness of the learning process and simplify administrative tasks if utilized optimally. In other words, teacher competence in using computers determines the success of technology integration in the world of education. Teachers who have the ability to manage technology well will be better prepared to face the challenges of 21st century learning.

Furthermore, the results of the study showed that the implementation of computer systems also improved the quality of the teaching and learning process. Teachers can access various digital learning resources that enrich teaching materials and prepare interesting presentation materials for students. One informant said that the use of PowerPoint and learning videos succeeded in increasing students' interest in learning in class. This is in line with the opinion of Sadiman et al. (2011) who stated that educational technology plays a role as a tool to improve learning effectiveness and enrich students' learning experiences.

However, it is undeniable that there are still some obstacles faced in the implementation of computer systems, especially the lack of technical training provided by schools. Some teachers expressed that they still have difficulty in using more complex computer features, such as data processing or online assessment applications. This is in accordance with Munir's statement (2012) that the success of technology integration in education is highly dependent on the readiness of human resources, especially teacher competence in operating computer devices and applications.

Another obstacle that arises is the lack of technical assistance and unequal access to computer devices among teachers. Teachers who do not have personal devices at home often experience difficulties when they have to work on digital-based assignments outside of working hours. According to Nasution (2008), the provision of supporting facilities and an adequate work environment is one of the important requirements in supporting the implementation of technology in the world of education. Without this support, the implementation of the computer system cannot run optimally.

In addition, the importance of support from school management is also highlighted in the results of this study. Schools that are proactive in providing training, holding technology workshops, and building a digital culture tend to have teachers who are more prepared and

innovative. This is in line with Sagala's opinion (2009) which states that good educational management will encourage teachers to develop through strengthening competencies and updating technology-based work methods.

Overall, this study concludes that the implementation of computer systems has a significant impact on improving teacher performance, both in terms of administration and learning. Although there are still technical constraints and limited competence, the use of computer systems has provided efficiency, accelerated work, and improved the quality of learning interactions. To achieve optimal implementation, it is necessary to increase teacher capacity through training, provision of facilities, and managerial support from the school.

Teacher motivation in using computer systems is also an important factor in the success of implementing technology in the school environment. Several teachers said that personal motivation to improve professionalism and the desire to provide more interesting learning to students were the main reasons they studied and implemented computer technology. This is in line with Uno's opinion (2012) who emphasized that intrinsic teacher motivation greatly influences performance and innovation in the learning process. Teachers who have a high enthusiasm for learning will be able to adapt more easily to technological developments even though they face limited facilities.

On the other hand, a collaborative work culture in schools has also been shown to influence the effectiveness of computer system implementation. Schools that have a culture of sharing information and helping each other between teachers create an environment that supports the improvement of digital competence. Senior teachers who are open to sharing experiences with less skilled colleagues can accelerate the process of technology adaptation. According to Sanjaya (2010), collaboration between educators in the school environment is one of the keys to success in technology-based learning transformation because it allows the creation of a professional learning community.

Another aspect that emerged in this study was the importance of integrating computer systems with the curriculum. Teachers stated that the use of computers would be more meaningful if it was in line with the demands of the curriculum, such as the Independent Curriculum which encourages the use of technology in differentiated learning. The use of computers in designing digital assessments, student portfolios, and project-based learning media is considered very helpful in meeting the specified learning outcomes. This is in accordance with Munir's (2012) idea that technology in education must be integrative, not just a technical aid, but part of a planned and contextual learning strategy.

The findings show that the computer system not only has an impact on the efficiency of teachers' work, but also opens up space for improving the quality of education as a whole. Teachers who are able to utilize technology will be more adaptive to change, more creative in presenting materials, and more responsive to student needs. Therefore, the development of

teachers' digital competence must be part of school and government policies on an ongoing basis. This effort is expected to encourage the creation of a modern, relevant learning environment and encourage lifelong learning.

5. Conclusion

Based on the results of the study, it can be concluded that the implementation of computer systems has a positive contribution to improving teacher performance in elementary schools. The use of computers makes it easier for teachers to prepare teaching materials, manage administration, and prepare more varied and interesting learning media. Teachers who are accustomed to using computers tend to be more efficient, organized, and creative in carrying out their duties. This shows that computer technology has become an important supporting tool in supporting teacher professionalism.The implementation of the computer system has not been fully optimized because several obstacles are still found, such as limited facilities, lack of training, and differences in teacher abilities in using technology. Therefore, there needs to be support from schools and related agencies, especially in terms of providing facilities and ongoing training programs so that all teachers have adequate digital competence. Thus, the computer system can be utilized optimally to improve the quality of learning and education in elementary schools.

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