

# The effect of technology utilization and creativity in the digital era on teacher performance

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## ABSTRACT

Technology utilizing and teacher creativity in the digital era are useful for developing teacher performance in learning methods, teacher activities in technology utilization and teacher creativity in the digital era affect teacher performance to create learning that is not monotonous. This analysis is carried out to find solution to problems regarding technology utilization. At SD.MI Jauharatun Naqiyah facilitates the lab to its students to be used as learning materials, the teacher uses Youtube, Zoom, and applications for learning so that studen are more interested in learning. Then ice Breaking is done to warm up before te satart of learning, the teacher also have E-Learning which is used for student assessment, as a result of this application, student are more somfortable in learning, if they do not feel bored quikly with the classromm learning atmosphere, of course, it also guides student to get used to digital technology, what is in SD/MI Jauharatun Naqiyah uses applications during the learning process, not only through Google Form, SD/MI Jauharatun Naqiyah also uses applications in making question and materials to its students.

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## 1. Introduction

The rapid advancements in digital technology have ushered in a new era, often referred to as the digital era or Society 5.0 (Akman & Erdirençelebi, 2024; Thakur et al., 2022). This era integrates advanced technologies into all aspects of life, emphasizing interconnectedness and efficiency (Javed et al., 2022; Rani et al., 2021). Within this context, education has undergone transformative changes, particularly in teaching methodologies and the role of teachers as facilitators of learning (Pherali et al., 2020; Reinius et al., 2022). According to Rahimi, Ramy A at. Al., (2024) the 21st century's rapid technological development has catalyzed paradigm shifts in learning processes, necessitating a move towards curriculum, media, and technology-driven methods. The integration of technology into education has proven instrumental in fostering creativity, engagement, and improved learning outcomes, aligning with global educational trends and demands.

Teachers, as pivotal agents of educational delivery, are at the forefront of this transformation. Bond, Melissa, et al., (2019) emphasize that creative use of technology in learning media enhances student engagement and interest. By adopting innovative tools and methodologies, teachers can create dynamic and effective learning environments that cater to diverse student needs. This shift underscores the importance of equipping educators with the skills and knowledge to leverage technological advancements effectively, ensuring their performance aligns with the demands of the digital era (Abulibdeh et al., 2024; Kanvaria & Yadav, 2024; Rahimi & Oh, 2024).

The primary research problem centers on the impact of technological integration and teacher creativity on teacher performance in the digital era (Bereczki & Kárpáti, 2021; Gözen et al., 2019; Henriksen et al., 2021).

While technology offers immense potential to revolutionize teaching methods, its effective utilization remains a challenge. The general solution lies in fostering teacher training and professional development programs that enhance technological proficiency and creativity. By doing so, educators can adapt to evolving educational paradigms and maintain high performance, ultimately improving the quality of education (Goh & Abdul-Wahab, 2020; Srivastava, 2023).

Training and professional development have been identified as key strategies for enhancing teacher performance in the digital age (Fernández-Batanero et al., 2022; Philipsen et al., 2019). Nursamsi (2023) conducted a study on the impact of training and technology utilization on the performance of junior high school teachers in Sidrap Regency. Their findings revealed that structured training programs significantly improved teachers' technological competencies, enabling them to implement more effective teaching strategies. The study highlights the importance of continuous professional development tailored to the needs of educators, ensuring they remain adept at using technological tools to foster student learning. Further, Henny Suharyatia (2019) explored the creativity of economics teachers in implementing learning models during the Revolution 4.0 era. The research demonstrated that creative teaching approaches, supported by digital tools, enhanced student engagement and learning outcomes. This underscores the necessity for educators to innovate within their teaching practices, combining technology with pedagogical creativity to address diverse learning challenges. Collectively, these studies emphasize the dual role of training and creativity in shaping teacher performance. While existing research has underscored the benefits of technology utilization and creativity in teaching, gaps remain in understanding how these factors interplay to influence teacher performance across various educational contexts. Keinänen et al. (2018) highlighted the significance of teacher performance assessments in ensuring educational quality but noted inconsistencies in how technological and creative competencies are evaluated. Similarly, Lawrence et al. (2018) emphasized the need for awareness programs on technology's role in education but identified a lack of sustained support systems to aid teachers in long-term integration efforts.

Another notable gap lies in the limited exploration of emotional and spiritual intelligence as mediators between creativity and teacher performance. Wajdi et al. (2018) found a positive correlation between these intelligences, creativity, and teacher performance, yet their study focused solely on civil servant teachers in a specific region. Broader research is needed to examine these dynamics across diverse educational settings and demographics, providing a more comprehensive understanding of factors influencing teacher effectiveness in the digital era.

The objective of this study is to investigate the combined impact of technology utilization and teacher creativity on teacher performance in the digital era, with a focus on identifying effective strategies for fostering innovation and adaptability in educational practices. The study aims to fill existing research gaps by exploring the interplay between technological, emotional, and creative factors in enhancing educational outcomes.

The novelty of this research lies in its holistic approach to examining teacher performance, integrating technological, creative, and emotional dimensions to provide actionable insights for policymakers and educators. By addressing underexplored aspects, such as long-term support systems and cross-regional applicability, the study offers a unique contribution to the field of educational research. The scope of the study encompasses a diverse range of educational institutions, including urban and rural schools, to ensure findings are representative and generalizable. It will also explore varying levels of technological access and teacher expertise, providing a nuanced understanding of the challenges and opportunities in leveraging technology and creativity for enhanced teacher performance.

## 2. Research Method

### a. Methodology

The methodology used by the author in solving the problem being researched is to use sampling. Sampling is selected based on the research view for a specific purpose, according to Serra et al. (2018) purposive sampling is a data source sampling technique with certain considerations. In this study, the sampling used used qualitative research by analyzing primary data collected from centralized interviews with people who are related and considered to know about what we are researching so that it will enable researchers to explore the object or situation under study.

In sampling in this study using five questions to ask five teachers at SD / MI Jauharatun Naqiyah to examine and obtain observations related to the use of technology and teacher creativity in the digital era on teacher performance. The five teachers will present the results or conclusions in the learning process carried out at the school being studied, namely SD / MI Jauharatun Naqiyah.

**b. Location and Time of Research**

The place used as research is SD / MI Jauharatun Naqiyah. Bidara China, Jatinegara, East Jakarta. November 2024 on the 8th. Hours 13.00 – Finish.

**c. Research Design**

The research design in this study uses qualitative research which aims to explain the problem to be studied, both natural and artificial which focuses on the quality and interrelationships between activities. Unlike descriptive research that manipulates variables, this research presents existing conditions without modification. As an example with the research title “The Effect of Technology Utilization and Creativity in the Digital Era on Teacher Performance” through the stages of interviews and documentation based on information from teachers who teach and through the learning process directly to obtain data that is as it is without exaggerating the results of the research. This research uses qualitative research methods to see the phenomenon of the process of developing Teacher Performance at SD / MI Jauharatun Naqiyah.

**d. Data Collection**

Data collection for “The Effect of Technology Utilization and Creativity in the Digital Era on Teacher Performance” with interviews, and documentation. Interviews are a form of data collection in qualitative with objectives and are preceded by several informal questions that are flexible and researchers can follow the interests and thoughts of participation. The interview technique is used to collect subjective data such as opinions, attitudes, and behavior of sources related to the phenomenon being studied. Documentation is a complement to the use of interview methods in qualitative research. Documentation is carried out by collecting qualitative facts and stored data in the form of photo archives. Documentation is a data source to complement researchers, both in the form of written sources, films, images (photos), and monumental works that all provide information for the

**3. Results And Discussions**

Variabel Operation according to Sugiyono (2013) is a complete set of instructions on what to observe in measuring or testing a varibel. According to sugiyono (2020) states”Research Variables (research objects) are an attribute or trait or value of people, objects or activites that have certain variations determined by research to be studied and then draw conclusions.” Varibel operations sre able to provide guidance, assist research in carrying out research so that data collection and analysis are more directed, efficient, and consistent.

**a. Technology Utilization (X1)**

Technology utilization is a way of utilizing the use of technology in performing tasks or work. Thw media used by techers are audio and video displayed through computers, LCD screens, and saves time. Technology as a learning mediun is used to solve educational and learning problems creatively, preciey and optimally in order to improve the quality and effetiveness and efficiency of learning. Information technology is described as a stimulus for quality teaching and learning activites. The developmpment of information technology that led to the brith of varios applications in the word of education requires teachers to heve a letpop process and complete learning administration. The utilization of technology onteacher performance has several indicators, namely: software, time efficiency, learning efectiveness.

**b. Creativity (X2)**

Teacher, creativity os the teacher’s ability to create new things in the learning process, so that learning becomes fun and not boring. By using creativity in a technological learning approach, teachers can improve performance, motivation and student engagement can increase significantly (Sun & Hsieh, 2018). Creative and innovative is a desire to produce new creations with passin and initiative in all situations. The spirit and creativiy of techers in the fiels of tecnology in the digital era is very beneficial for the field of education, incarrying out creativity in sustainable learning methods that can produce a millennial generation that is smat, characterized, superior, creative and culture. In techer creativity in the dogital era on techer performance has several inidcations, namaely: finding new ideas, developing intersting an diverse activities and utilizing technology.

**c. Teacher Performance (Y)**

Teacher performance is the result of work at school in accordance with the authority and responsibilities given in achieving the vision, mission, and goals in accordance with their resposibilities.

Gómez et al, (2019) teacher performance is basically more focused on the behavior of an educator in his work and the effectiveness of educators in carrying out their duties and responsibilities which can influence students to the desired goals. Teacher performance according to Rostini et al, (2022) is the ability of a teacher to perform actions in accordance with predetermined goals, which include aspects of planning learning programs, teaching and learning processes, creating and maintaining optimal classes, and learning outcomes. Teacher performance has several indicators, namely: learning instructions, application of positive discipline, and interactive activities.

### **Development Indicator**

#### **1. Technology Utilization on Teacher Performance**

Indicators of Technology Utilization (X1) include:

##### **a. Software**

The software intended for teachers to use such as presentations to present material visually supports text, images, videos, and animations to make it easier to understand. There are also software-based learning media used in the form of educational videos, e-learning, e-books, and simulators. The purpose of software design is to build a data system that can be integrated between administration, academics and leaders as a party that monitors the progress of the institution, and spurs the process of administrative services and academic services.

##### **b. Time Efficiency**

As the use of technology makes it easier to deliver material in accordance with the modules in the curriculum. The learning process is more effective and efficient, with the use of technology teachers are helped because they do not need to waste paper with piles of paper and can process work such as student learning outcomes, student materials, and student exams through e-learning. Illustrations and writings needed can be reached by the teacher in a timely and fast manner through the facilities contained in the computer

##### **c. Learning Effectiveness**

When using visual and simulation applications, it is easier for students to understand the concept of the material provided because of the description and explanation. The use of media or the utilization of technology can attract students when compared to monotonous oral descriptions that make students bored quickly. Teachers can utilize active technology to achieve learning effectiveness so that student can more easily understand what is explained.

H1: Technology Utilization has a significant effect on Teacher Performance

#### **2. Creativity in the Digital Era on Teacher Performance**

Indicators of Creativity on Teacher Performance (X2) include:

##### **a. New Ideas**

New ideas that teachers can use regarding their creativity such as presenting learning with imaginative concepts, varying and stimulating ideas through original works such as presenting games and other games through the web. With this media, students will more easily learn everything that they can directly see, hear, hold and feel.

##### **b. Developing Activities**

Teacher creativity by developing interesting and diverse activities helps teachers to solve problems related to students. By developing activities can encourage students to learn more independently, learning media specifically designed for certain learning used to students both individually and in groups.

##### **c. Utilizing Technology**

The utilization of technology can allow teachers to create an atmosphere that is more varied, fun, and supports students creativity in learning so that it can increase student interest in learning. The use of media designed according to student needs can have a positive effect on learning outcomes.

H2: Creativity in the Digital Era on Teacher Performance

#### **3. Technology Utilization and Creativity affect Teacher Performance**

Indicators of Teacher Performance (Y) include:

##### **a. Learning Instruction**

Is a learning process in the classroom that is used to convey material to students. Learning instructions from teacher are very important for student achievement results, an effective learning strategy will make the learning process active so that it can foster students' interest and critical reasoning. A good

strategy starts from the teacher's learning instructions to his students being able to create open and compassionate communication, also able to develop critical thinking skills for students, which will encourage students to ask, analyze, and evaluate the information conveyed by the teacher carefully, resulting in sustainable understanding.

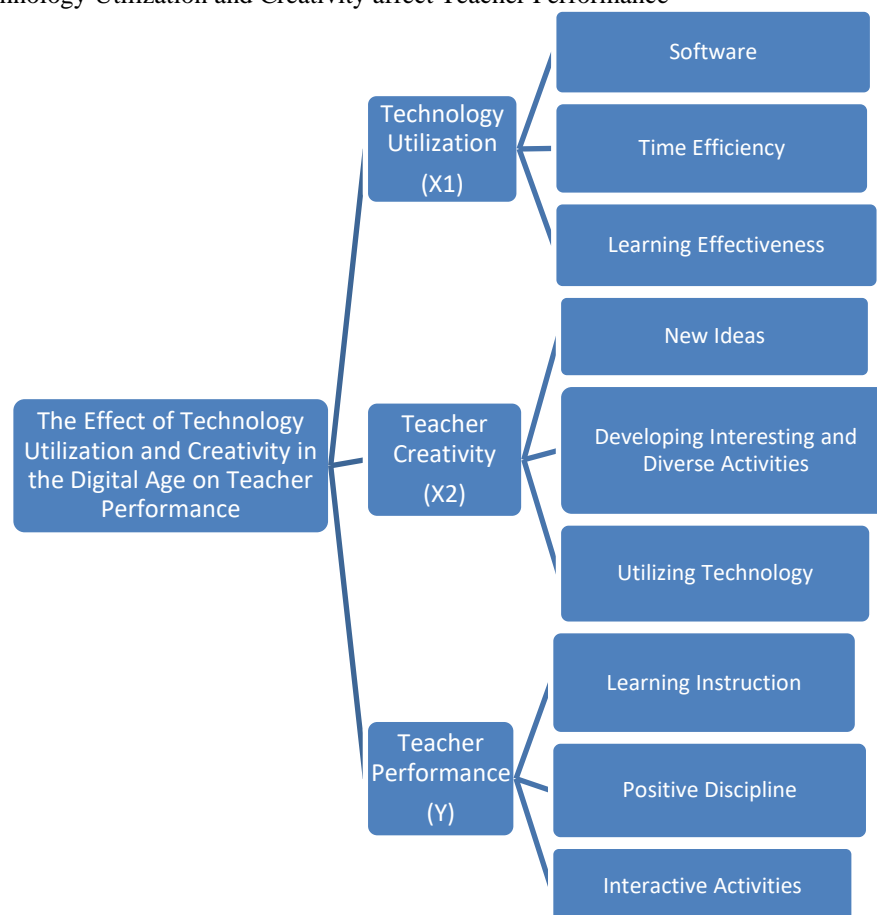
**b. Application of Positive Discipline**

The importance of strengthening the value of disciplinary character from an early age is based on the reason that there is a lot of undisciplined behavior in the environment. Application of discipline. In fostering children's discipline character education, the right method is needed, in applying character discipline, you cannot use violent punishment, violence will have a negative impact on children. Physical and psychological punishment does not make children more independent, strong and smart but denies children's rights to get humanizing education. Various studies have shown that punishment and violence will not have any positive impact. Instead, punishment has a long-term negative impact on children (Heilmann et al., 2021). The application of positive discipline includes: 1. Mutual respect. 2. Identifying the motive behind the child's behavior/actions. 3. Effective communication and problem-solving skill. 4. Discipline that teaches rather than being permissive or punitive. 5. Focus on solutions, not punishment and. 6. Providing encouragement for improvement.

**c. Interactive Activities**

Interactive activities involve teachers and students with good feedback, involving two or more directions of interaction discussing the material covered. The purpose of interactive activity learning is to increase students' active participation in learning, increase social understanding between students and the surrounding environment, encourage students to be able to find, investigate the material being studied themselves, and help students form effective cooperation to share information and use their ideas, and train students to think analytically and solve problems.

H3: Technology Utilization and Creativity affect Teacher Performance



**Picture 1.** Framework of Thinking

**Table 1. Interview Questions and Answers****Question 1: What are the uses of technology by teachers for the learning process?**

Mrs. Lia: "Not monotonous and using books, so we can watch videos from Youtube and applications."

Mrs. Dian: "Providing lessons to children and there are also variations of the same as explained by watching videos from Youtube or applications."

Mr. Asep: "It can also use methods that enter the digital era, meaning that we have to follow where technology becomes an influence for learning, especially in the field of education."

Mr. Repto: "The use of technology in the digital era, we must follow the digital era where technology becomes an influence for learning, especially in the field of education."

Mr. IT: "Schools develop technology into learning media. Of course, it makes it easier for teachers to teach their students and also add insight to the students. In addition, the school also uses digital technology in making questions for exams, as a small example for grade 6 will be developed again from Google and other media such as Zoom, E-Learning. In Madrasah, we use E-Learning, even teaching is also available in E-Learning both learning modules, ATP, CP, and also student achievements."

**Question 2: How to implement the use of technology? Is it more efficient?**

Mrs. Lia: "Not all of us can master the technology or some teachers still can't, so they are guided again."

Mrs. Dian: "We are not all tech-savvy teachers, but the Ministry of Education provides training in technology to make teaching and learning easier."

Mr. Asep: "We are also in the application of teachers for technology in this Madrasah we use E-Learning in assessment from teachers to students."

Mr. Repto: "So we agree in the use of this technology we use E-Learning in training in teaching and learning."

Mr. IT: "For the teachers themselves, there are many challenges because some teachers do not all understand about technology and there are still those who are gaptek (stuttering technology). So the challenge for teachers themselves is very big, especially as they get older it is difficult to learn digital technology."

**Question 3: How do teachers get creative with the applications used to increase students' motivation to learn?**

Mrs. Lia: "So the development for students can be seen directly with E-Learning. In class we also sometimes ask questions to the children, so there is feedback for students whether they can understand or we have to improve again."

Mrs. Dian: "We also use class discussions in learning to be more active in students for feedback between teachers and students."

Mr. Asep: "We also use quizzes to make learning more interesting for students."

Mr. Repto: "Teachers who utilize digital such as existing applications, but in Madrasah itself it has been capitalized, meaning facilitated by the Ministry of Education."

Mr. IT: "For the elementary school level itself, not all of them also understand digital so we still guide them. Small questions such as questionnaires are still used, and for test sessions we use Google Forms to facilitate student exam results and also teachers provide more effective assessments."

**Question 4: From the utilization and creativity of technology that has been determined by the teacher, what changes in the learning process of students?**

Mrs. Lia: "We also use other sources, but we add a little more to our creativity so that the children will always want to study with us in a practical way, we give quizzes or questions and answers or make games so that they are happy."

Mrs. Dian: "In this Madrasah school, according to the Ministry of Education, this Independent Curriculum, we are facilitated with modules in learning to students."

Mr. Asep: "We also facilitate the Computer Lab in learning to be easier and more effective in technology in the Merdeka Curriculum."

Mr. Repto: "Students will become more focused when learning using quizzes or questions and answers and when the teaching and learning process is not conducive, ice breaking will be done to restore students' focus."

Mr. IT: "For the changes, we are now following the Merdeka Curriculum, so student character achievement every semester must be achieved. For the changes, we still use the aajr module as the teacher's handbook."

**Question 5: What are the teachers' challenges in implementing the use of technology and student creativity in their learning?**

Mrs. Lia: "Our challenge in learning using technology is that teachers who are gaptek (technology illiterate) are a big challenge in learning, especially older teachers."

Mrs. Dian: "Teachers who have taught seriously but students are not serious in the learning that is taught."

Mr. Asep: "The assessment conducted by teachers using E-Learning to measure students' understanding in the teaching and learning process, but the value in the input cannot be changed anymore."

Mr. Repto: "Learning in the Computer Lab room is a challenge for teachers, because students are more focused on games on the computer than the material being explained by the teacher."

Mr. IT: "Our biggest challenge is that teachers who are older still don't understand technology. For example, the IT operator first learns the information from the National Education Office and conveys it to the teachers."

**Question 1: What are the uses of technology by teachers for the learning process?**

The utilization of technology at SD/MI Jauharatun Naqiyah makes it easier for teachers to conduct learning, to students and also add insight to these students. The learning method at SD/MI Jauharatun Naqiyah is not watching, the school gives lessons to children with audio-visual variations and images such as using Youtube videos or other applications. Teaching materials are also available by using E-Learning both in learning modules/ATP, CP, and also student achievement.

**Question 2: How to implement the use of technology? Is it more efficient?**

Not all teachers are technologically savvy, especially older teachers who find it difficult to learn digital technology. So the teachers usually get guidance first with the IT people or staff will explain how to implement the method to the teachers, so that the teachers can implement it. If it is more efficient, it is certainly more efficient because the teachers' tasks are helped by not using sheets of paper that accumulate, as well as learning methods that can be more easily accessed and given to their students.

**Question 3: How do teachers get creative with the apps they use to increase students' motivation to learn?**

The way teachers utilize digital to be creative in learning is by using question and answer learning methods, questionnaires, E-Learning and Google Forms. For elementary school level, not all of them understand digital so teachers still guide students to learn. So the development for students will be seen through E-Learning and when in class the teachers ask random questions to students, when learning between teachers and students have feedback from each other so that teachers know whether students can understand the material explained.

**Question 4: From the utilization of technology and technological creativity that has been applied by teachers, is there any change in the learning process of students?**

The changes used at SD / MI Jauharatun Naqiyah follow the Merdeka Curriculum so that the character achievement of each student must meet the standards of the teachers' handbooks and then use other sources that make students interested in always learning and make the classroom atmosphere less monotonous.

**Question 5: What are the challenges for teachers in implementing the use of technology and creativity towards students in the learning process?**

One of the biggest challenges for teachers is that many of them are elderly and do not understand technology, so it is difficult to guide or conduct training to learn digital technology, therefore usually the IT operator field first studies information from Diknas and conveys it to teachers. And for students if the operator himself starts from grade 5 by using school facilities, namely the Computer Lab, where students can access Youtube videos, applications or materials online. Because grades 1-4 are only in audio visual facilities and images to understand the material.

**Discussion**

Technology utilization basically affects teacher performance in carrying out learning activities, teachers as someone who plays an important role in technology must follow technological advances. Teachers must be able to use technology in learning at school, because conventional methods have begun to be abandoned. The methods used for learning are no longer only through books and listening to teachers speak, but along with keeping up with the times, teachers must change methods by utilizing technology. The utilization of technology is intended to make children more active in order to build a more confident soul, think critically, and hone a broader mindset.

In connection with the use of technology, there must be teacher creativity in utilizing facilities that are increasingly developing so that teacher performance can also run. Facing the era of the industrial revolution 4.0, teachers are not the center of learning of Teacher Centered Learning (TCL) but require active students called Student Centered Learning (SCL). Teachers must be able to create innovations in every lesson taught, such as utilizing social media in positive activities, such as YouTube, Zoom, or Gform.

In the utilization of technology and creativity in the digital era, teacher performance can be in the form of efforts to utilize the computer lab facilitated by the school, it can also be through websites specifically created as learning, and the applications provided are also related to learning materials. Both are important for teacher performance, because through them teachers are also easier to supervise their students. So that it makes it easier for teachers to do their work, such as being able to monitor student activities through a website that has been made specifically for teacher duties.

As in SD / MI Jauharatun Naqiyah, the school facilitates the computer lab provided to help the teacher's performance. Such as GForm which is used for making questions during exams, material through YouTube, special student websites, Zoom for distance learning, and E-Learning specifically for monitoring and student development results. So that it does not require piling up paper that complicates work, so work is more effective and efficient.

#### 4. Conclusion

Technology utilization basically affects teacher performance in carrying out learning activities, teachers as someone who plays an important role in technology must follow technological advances. Teachers must be able to use technology in learning at school, because conventional methods have begun to be abandoned. The method used is no longer only through books and listening to the teacher speak, but along with the times, teachers must change methods by utilizing technology. The utilization of technology is intended to make children more confident, think critically, and hone a broader mindset. In connection with the use of technology, there must be teacher creativity in utilizing facilities that are increasingly developing so that teacher performance can run. Facing the era of the industrial revolution 4.0, teachers are not the center of learning or Teacher Centered Learning (TCL) but require active students called Student Centered Learning (SCL). Teachers must be able to create innovation in every lesson taught, such as utilizing social media in positive activities such as Youtube, Zoom or Google From. In the utilization of technology and creativity in the digital era, teacher performance can be in the form of efforts to utilize the computer lab facilitated by the school, it can also be through websites specifically created as learning, and the applications provided are also related to learning materials. Both are important for teacher performance because through them teachers are also easier to supervise their students. So that it makes it easier for teachers to do their work, such as being able to monitor work, such as being able to monitor student activities through a website that has been created specifically for teacher duties. As in SD / MI Jauharatun Naqiyah, the school facilitates the computer lab provided to help teacher performance. Such as Google Forms used for making questions when exams, material through Youtube, special student websites, Zoom for distance learning, and E-Learning specifically for monitoring and student development results, so that it does not require piling up paper that complicates work, so work is more effective and efficient.

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