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Analysis of the Application of Technology, Training, and Work Discipline on Teacher Performance with Competence as an Intervening Variable at UPT SMP Negeri 19 Medan

Rinaldi Rizal Affandi[1], Yohny Anwar[2], Muhammad Toyib Daulay[3]
Universitas Pembangunan Pancabudi, Indonesia[1,2,3]
Corresponding email: *rinaldirizal988@gmail.com*, *yohnyanwar@dosen.pancabudi.ac.id*

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ABSTRACT

This study aims to analyze the effect of technology implementation, training, and work discipline on teacher performance with competence as an intervening variable. This research uses a quantitative approach with an associative research type. The population in this study consisted of all teachers totaling 50 people, and the sampling technique used was a census method, so the entire population was used as the sample with 100 respondents. The data analysis method used was Structural Equation Modeling (SEM) based on Partial Least Square (PLS) with the assistance of SmartPLS software. The results showed that work discipline has a positive and significant effect on teacher performance and competence. Competence also has a positive and significant effect on teacher performance. Training has a positive and significant effect on competence but does not have a significant effect on teacher performance. Technology implementation does not have a significant effect on teacher performance or competence. Furthermore, competence is proven to mediate the effect of work discipline and training on teacher performance, but it does not mediate the effect of technology implementation on teacher performance. Therefore, improving teacher performance can be achieved through enhancing work discipline and teacher competence.

Introduction

Education has a strategic role in shaping the quality of excellent and competitive human resources. The success of the education system is largely determined by the quality of teachers as the main executors of the learning process in schools. Teachers not only function as deliverers of material but also as facilitators, motivators, guides, and agents of change who play a role in shaping the character and competencies of students. Therefore, improving teacher performance is one of the main priorities in efforts to enhance the quality of education. In this rapidly developing era of digital transformation, the world of education is undergoing significant changes, especially regarding the implementation of learning

technology. The integration of information and communication technology into the teaching and learning process has become an unavoidable necessity. Teachers are required to be able to utilize various digital devices, learning platforms, interactive media, and technology-based administrative systems to create effective, efficient, and engaging learning. The appropriate application of technology can improve the quality of learning interactions, expand access to information, and encourage innovation in teaching methods.

However, the successful implementation of technology greatly depends on the readiness and ability of teachers to master and integrate it into learning practices. Not all teachers have the same level of digital literacy. Differences in age, experience, and opportunities for professional development often influence the level of technology mastery. This condition can impact the variation in the quality of learning provided to students.

Besides technology implementation, training is an important factor in improving the quality of human resources in the school environment. Training provides opportunities for teachers to update their knowledge, improve pedagogical and professional skills, and understand the latest educational policies such as curriculum changes and competency-based learning methods. Effective training is not only theoretical but also able to have a real impact on improving teachers' teaching abilities. However, in practice, not all training attended by teachers directly contributes to improving the quality of learning. Sometimes there is a gap between the training material and its implementation in the classroom, so its impact on performance is not yet optimal. Another equally important factor is work discipline. Discipline reflects an individual's level of compliance and responsibility towards established rules, schedules, and work standards. Teachers with high work discipline will be more consistent in carrying out their duties, starting from punctual attendance, preparing learning tools, implementing the teaching and learning process according to schedule, to completing academic administration. Good work discipline will create an orderly, professional, and productive work environment, which ultimately affects performance improvement.

Teacher performance itself can be seen from the extent to which teachers are able to carry out their duties and responsibilities effectively, both in terms of learning planning, learning implementation, evaluation of learning outcomes, and continuous professional development. Optimal performance is not only influenced by external factors such as technology and training but is also greatly influenced by internal factors, namely the competence possessed by the teacher. Competence becomes the main foundation in determining the quality of performance, because competence reflects the pedagogical, professional, social, and personal abilities integrated into task execution. In this context, competence is hypothesized to act as an intervening variable that bridges the influence of technology implementation, training, and work discipline on teacher performance. Effective technology implementation can enhance teachers' digital and pedagogical competence. Continuous training can strengthen professional and methodological competence. Consistent work discipline can support continuous competence development. Increased competence will ultimately have a direct impact on improving teacher performance. This phenomenon is

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also relevant to study at UPT SMP Negeri 19 Medan as one of the public junior high schools in Medan City. In facing the demands of implementing a competency-based curriculum and educational digitalization, the school is required to ensure that all teachers can adapt to these changes. Although various efforts have been made through the provision of technology facilities and teacher participation in training, there are still variations in the level of technology utilization, consistency of work discipline, and the quality of learning implementation.

Some teachers have demonstrated the ability to utilize digital learning media and apply innovative methods in the classroom. However, there are still teachers who tend to predominantly use conventional methods. Furthermore, the implementation of training results has not been fully evenly applied in daily learning practices. Variations in the level of discipline in aspects of attendance, punctuality, and completion of learning administration are also factors that can affect overall performance quality. This condition shows that improving teacher performance cannot be separated from the synergy between technology implementation, training effectiveness, and work discipline, all of which need to be supported by adequate competence. Therefore, this research is important to empirically analyze how technology implementation, training, and work discipline affect teacher performance, and to what extent competence acts as an intervening variable in these relationships. The results of the study are expected to contribute academically and practically to efforts to improve the quality of education, especially at UPT SMP Negeri 19 Medan.

Method

This study uses a quantitative approach with an associative research method. According to Sugiyono (2019), the quantitative research method is a research method based on the philosophy of positivism, used to study a specific population or sample, sampling techniques are generally done randomly, data collection uses research instruments, and data analysis is statistical in nature with the aim of testing predetermined hypotheses. According to Sugiyono (2019), associative research is research that aims to determine the relationship or influence between two or more variables. Therefore, this study aims to determine the effect of competence, motivation, and reward on employee performance with work spirit as an intervening variable.

According to Sugiyono (2019), the population is a generalization area consisting of objects or subjects that have certain qualities and characteristics determined by the researcher to be studied and then conclusions drawn. The population in this study were all teachers of SMP Negeri 19 Medan, totaling 50 people. According to Sugiyono (2019), the sample is a part of the number and characteristics possessed by the population. The sampling technique in this study used a saturated sample technique (total sampling). According to Sugiyono (2019), a saturated sample is a sampling determination technique when all members of the population are used as samples.

Data Analysis Technique

This study uses the Partial Least Squares (PLS) method with the help of SmartPLS software. According to Ghozali (2020), PLS-SEM is a variance-based Structural Equation Modeling analysis method used to test relationships between latent constructs and is very suitable for use in research with a relatively small sample size and does not require normally distributed data. According to Ghozali (2020), PLS aims to predict relationships between constructs by developing a robust structural model and can be used to test theories that are still in the development stage.

Stages of PLS Data Analysis

According to Ghozali (2020), PLS analysis is carried out through two main stages: evaluation of the measurement model (outer model) and evaluation of the structural model (inner model).

Evaluation of the Measurement Model (Outer Model)

According to Ghozali (2020), the outer model evaluation is carried out to assess the validity and reliability of the constructs through:

1. Convergent Validity Measured by looking at the loading factor value. A loading value > 0.70 is declared valid.
2. Discriminant Validity Measured by looking at the cross-loading values or the Fornell-Larcker Criterion to ensure each construct is different from other constructs.
3. Composite Reliability A value > 0.70 indicates that the construct has good reliability.
4. Cronbach's Alpha A value > 0.70 indicates adequate internal consistency.

Evaluation of the Structural Model (Inner Model)

According to Ghozali (2020), the inner model evaluation is carried out to test the relationships between latent variables by looking at:

1. R-Square (R^2): Used to measure how much the independent variables can explain the dependent variable.
2. Path Coefficient: To determine the direction of the relationship and the strength of the influence between variables.
3. Bootstrapping: Used to test the significance of the effect by looking at the t-statistic and p-value.

Results and Discussion

Outer Model Analysis

The outer model analysis was conducted to evaluate the extent to which the indicators used can measure the latent constructs validly and reliably. This assessment includes internal reliability, convergent validity, and discriminant validity. Additionally, convergent validity was examined using the Average Variance Extracted (AVE). The analysis results show that all constructs have AVE above 0.5. This indicates that more than 50% of the indicator variance can be explained by the measured construct, thus these indicators are convergently valid.

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Convergent Validity

Convergent validity is used to assess the extent to which the indicators of a construct truly measure that construct. In this study, convergent validity was measured through two main parameters loading factor and Average Variance Extracted (AVE). The analysis results show that all indicators have loading factors above 0.7, meaning each indicator has a strong contribution to its respective construct.

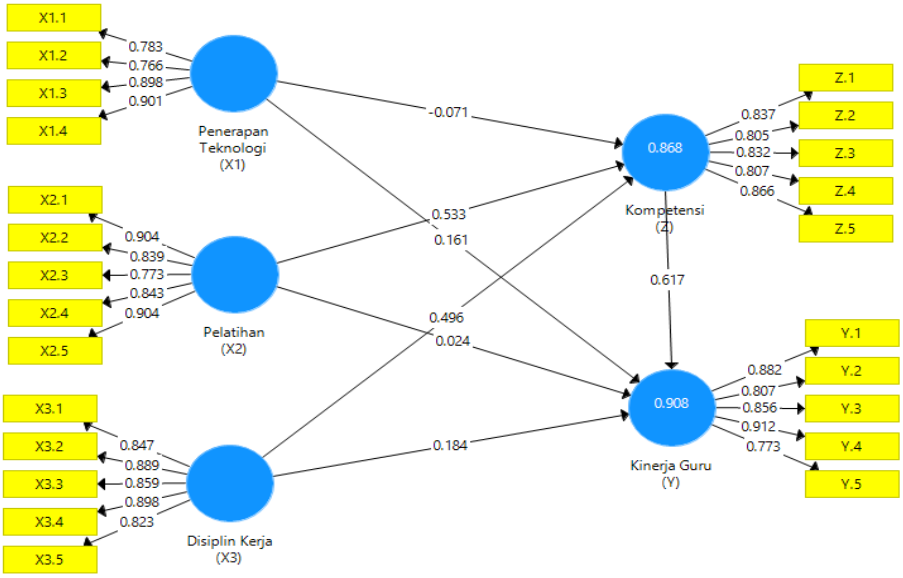

Figure 1. Outer Model

Source: Output Smart PLS 3.3.3

Table 1. Outer Loadings

	Work Discipline_ (X3)	Teacher Performance_ (Y)	Competence_ (Z)	Training_ (X2)	Technology Implementation_ (X1)
X1.1					0,783
X1.2					0,766
X1.3					0,898
X1.4					0,901
X2.1				**0,904**	0,813
X2.2				**0,839**	0,790
X2.3				**0,773**	0,798
X2.4				**0,843**	0,846
X2.5				**0,904**	0,871
X3.1	**0,847**				0,689
X3.2	**0,889**				0,763
X3.3	**0,859**				0,731
X3.4	**0,898**				0,790

X3.5	0,823				0,622
Y.1		0,882			0,753
Y.2		0,807			0,688
Y.3		0,856			0,785
Y.4		0,912			0,768
Y.5		0,773			0,661
Z.1			0,837		0,614
Z.2			0,805		0,731
Z.3			0,832		0,734
Z.4			0,807		0,671
Z.5			0,866		0,785

Source: Output Smart PLS 3.3.3

Based on Table 1, the outer loadings test results show that all indicators for the variables Technology Implementation (X1), Training (X2), Work Discipline (X3), Competence (Z), and Teacher Performance (Y) have loading factor values above 0.70. This indicates that all indicators are declared valid and able to reflect each variable well. For the Technology Implementation variable (X1), outer loading values ranged from 0.766 to 0.901. The Training variable (X2) had values between 0.773 and 0.904. Work Discipline (X3) showed values between 0.823 and 0.898. Furthermore, the Teacher Performance variable (Y) had values between 0.773 and 0.912, and the Competence variable (Z) ranged from 0.805 to 0.866. Therefore, it can be concluded that all indicators in this study have met the convergent validity criteria, making them suitable for further analysis.

Composite reliability

In composite reliability testing, each variable is evaluated using its reliability value; if the variable value is greater than 0.60, the research is considered reliable; if between 0.60 and 0.7, it is considered unreliable. The table below shows the values of Cronbach's alpha, composite reliability, and AVE, which are used to determine whether the research is reliable and valid.

Table 2. Construct Reliability and Validity

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Work Discipline_(X3)	0,914	0,936	0,746
Teacher Performance_(Y)	0,901	0,927	0,718
Competence_(Z)	0,887	0,917	0,689
Training_(X2)	0,906	0,931	0,729
Technology Implementation_(X1)	0,858	0,904	0,704

Source: Output Smart PLS 3.3.3

Based on Table 2, the test results show that all variables have Cronbach's Alpha values above 0.70, meaning each construct has a good level of reliability. The composite reliability values are also above 0.70, so all variables are declared consistent in measuring their constructs. Additionally, the Average Variance Extracted (AVE) values for each variable are above 0.50, indicating that each construct has met the convergent validity criteria. Thus, the variables Work Discipline (X3), Teacher Performance (Y), Competence (Z), Training (X2), and Technology Implementation (X1) are declared reliable and valid, making them suitable for further analysis.

Inner Model Analysis

The structural model (inner model) is evaluated to ensure the resulting basic model is strong and correct. Several indicators can be used to identify the stages of checking the main model assessment, including:

Coefficient of Determination (R2)

Based on the data processing performed using the SmartPLS 3.0 program, the R Square values are as follows:

Table 3. R Square Results

	R Square	Adjusted R Square
Teacher Performance_(Y)	0,908	0,900
Competence_(Z)	0,868	0,859

Source: Output Smart PLS 3.3.3

Based on Table 3, the R Square value for the Teacher Performance variable (Y) is 0.908 and the Adjusted R Square is 0.900. This indicates that 90.8% of the variation in Teacher Performance can be explained by the independent variables in the model, while the remaining 9.2% is influenced by other variables outside the study. Furthermore, the Competence variable (Z) has an R Square value of 0.868 and an Adjusted R Square of 0.859, meaning that 86.8% of the variation in Competence can be explained by the variables in the model, while the remaining 13.2% is influenced by other factors outside the study. Therefore, this research model is considered strong in explaining the relationships between the variables studied.

Hypothesis Testing

After assessing the inner model, the next step is to assess the relationships between latent constructs as hypothesized in this study. Hypothesis testing in this study was conducted by looking at the T-Statistics and P-Values. A hypothesis is declared accepted if the T-Statistics value > 1.96 and P-Values < 0.05. Here are the direct effect Path Coefficients:

Table 4. Path Coefficients (Direct Effects)

	Original Sample Asli (O)	T Statistics (| O/STDEV |)	P Values	Results
Work Discipline_(X3) -> Teacher Performance_(Y)	0,184	2,114	**0,018**	**Accepted**
Work Discipline_(X3) -> Competence_(Z)	0,496	3,804	**0,000**	**Accepted**
Competence_(Z) -> Teacher Performance_(Y)	0,617	5,766	**0,000**	**Accepted**
Training_(X2) -> Teacher Performance_(Y)	0,024	0,124	**0,451**	**Rejected**
Training_(X2) -> Competence_(Z)	0,533	1,858	**0,032**	**Accepted**
Technology Implementation_(X1) -> Teacher Performance_(Y)	0,161	0,963	**0,168**	**Rejected**
Technology Implementation_(X1) -> Competence_(Z)	-0,071	0,306	**0,380**	**Rejected**

Source: Output Smart PLS 3.3.3

Work discipline has a positive and significant effect on teacher performance with a coefficient value of 0.184, T-statistic of 2.114, and P-Values of 0.018 (<0.05). Thus, the hypothesis is accepted, meaning better work discipline will improve teacher performance. Work discipline has a positive and significant effect on competence with a coefficient value of 0.496, T-statistic of 3.804, and P-Values of 0.000 (<0.05). This means the hypothesis is accepted, so high work discipline can improve competence.

Competence has a positive and significant effect on teacher performance with a coefficient value of 0.617, T-statistic of 5.766, and P-Values of 0.000 (<0.05). Thus, the hypothesis is accepted, indicating that good competence will improve teacher performance. Training does not have a significant effect on teacher performance with a coefficient value of 0.024, T-statistic of 0.124, and P-Values of 0.451 (>0.05). Therefore, the hypothesis is rejected, meaning training is not yet able to directly improve teacher performance. Training has a positive and significant effect on competence with a coefficient value of 0.533, T-statistic of 1.858, and P-Values of 0.032 (<0.05). Thus, the hypothesis is accepted, so training can improve competence. Technology implementation does not have a significant effect on teacher performance with a coefficient value of 0.161, T-statistic of 0.963, and P-Values of 0.168 (>0.05). Thus, the hypothesis is rejected, indicating that technology implementation

has not yet had a direct impact on teacher performance. Technology implementation does not have a significant effect on competence with a coefficient value of -0.071, T-statistic of 0.306, and P-Values of 0.380 (>0.05). Thus, the hypothesis is rejected, meaning technology implementation does not affect competence improvement.

Table 5. Path Coefficients (Indirect Effects)

	Original Sample Asli (O)	T Statistics (| O/STDEV |)	P Values	Results
Work Discipline_(X3) -> Competence_(Z) -> Teacher Performance_(Y)	0,306	3,036	**0,001**	**Accepted**
Training_(X2) -> Competence_(Z) -> Teacher Performance_(Y)	0,329	1,739	**0,041**	**Accepted**
Technology Implementation_(X1) -> Competence_(Z) -> Teacher Performance_(Y)	-0,044	0,304	**0,381**	**Rejected**

Source: Output Smart PLS 3.3.3

Work discipline has a positive and significant effect on teacher performance through competence with a coefficient value of 0.306, T-statistic of 3.036, and P-Values of 0.001 (<0.05). Thus, the hypothesis is accepted, meaning competence can mediate the effect of work discipline on teacher performance.

Training has a positive and significant effect on teacher performance through competence with a coefficient value of 0.329, T-statistic of 1.739, and P-Values of 0.041 (<0.05). Therefore, the hypothesis is accepted, indicating that competence acts as a mediating variable in the relationship between training and teacher performance. Technology implementation does not have a significant effect on teacher performance through competence with a coefficient value of -0.044, T-statistic of 0.304, and P-Values of 0.381 (>0.05). Thus, the hypothesis is rejected, meaning competence is unable to mediate the effect of technology implementation on teacher performance.

Conclusion

1. Work discipline has a positive and significant effect on teacher performance at UPT SMP Negeri 19 Medan.
2. Work discipline has a positive and significant effect on competence at UPT SMP Negeri 19 Medan.
3. Competence has a positive and significant effect on teacher performance at UPT SMP Negeri 19 Medan.

4. Training does not have a significant effect on teacher performance at UPT SMP Negeri 19 Medan.
5. Training has a positive and significant effect on competence at UPT SMP Negeri 19 Medan.
6. Technology implementation does not have a significant effect on teacher performance at UPT SMP Negeri 19 Medan.
7. Technology implementation does not have a significant effect on competence at UPT SMP Negeri 19 Medan.
8. Work discipline has a significant effect on teacher performance through competence (there is a mediation effect) at UPT SMP Negeri 19 Medan.
9. Training has a significant effect on teacher performance through competence (there is a mediation effect) at UPT SMP Negeri 19 Medan.
10. Technology implementation does not have an effect on teacher performance through competence (there is no mediation effect) at UPT SMP Negeri 19 Medan.

Declarations

Statement on the Use of Artificial Intelligence. Declares whether or not AI was used in the article.

Author contribution statement. Describes the contribution of each author to the conduct of the research and the preparation of the article, in accordance with the conventions of the specific field of study.

Funding statement. Lists funding sources and grant numbers, if applicable, or states that no funding was received.

Conflict of interest. Discloses the presence or absence of any conflicts of interest regarding the publication of the article.

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