

Improving Teacher Performance with Innovative Behavior, Information Technology Skills, and School Work Environment

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Abstract. The most valuable human resource in schools is the teacher. The success and sustainability of the school depend heavily on teacher performance. Teachers are school resources who accompany and deliver school students to achieve academic performance. This study aims to identify what factors most determine teacher performance. This study examines the effect of teacher innovative behavior, information technology skills, and school work environment on teacher performance. This study uses the entire population as a sample, employing a saturation sample method. The object of the research is a vocational high school which is a model vocational school in Yogyakarta, Indonesia. All 162 teachers were invited to fill out the questionnaire, but 104 teachers were willing to fill out the questionnaire (response rate 64%). SPSS was used to examine the data. The data analysis findings demonstrate that the developed hypothesis is supported by teachers' innovative behavior, information technology skills, and the school working environment. The study looked at three independent variables, and the school work environment was found to have the most substantial impact on teacher performance. This study explains the relationship between each variable to teacher performance. This investigation introduces novel perspectives on the variables that influence teacher performance.

1 Introduction

Digital age developments impact all industries by offering fast and interactive services. The educational landscape must also change, particularly how school teachers approach the teaching and learning process. The most crucial human resource in efforts to improve school performance is teachers. Therefore, to improve school performance, the main thing that needs to be considered is teachers' performance. The study of [1] presents that the perceived strength of the performance management process is negatively related to teacher burnout but is positively related to teacher performance. The study discusses the relationship between the strength of the performance management process and its impact on teacher performance through affective organizational commitment. [2] measures

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teacher performance as one of the foundations of strategic management of human resources in education. Teachers are human capital for the implementation of education. Therefore, studying the factors that can improve teacher performance is important.

Assessing teacher performance is a fascinating subject to research, especially in the era of rapid technological advancement. Teachers must be able to act innovatively [3]; [4], and have skills in mastering information technology [5];[6], with a conducive school work environment [7];[8]. Teachers' Innovative Behavior (TIB), Information Technology Skills (ITS), and School Work Environment (SWE) are all investigated in this study to see how they affect teacher performance. Teachers play a vital role in education because they substantially impact educational achievement. Even if it continues to play a crucial role in global progress, science, and technology, molding a student's character is also an essential duty for a teacher. Especially in the era of advances in information technology, which is a tool to convey various forms of teacher learning.

The study of teacher performance will always be discussed throughout the ages because teacher characteristics and productivity are a matter of how best to evaluate teacher performance. Suppose teacher productivity is not strongly correlated with educational attainment. In that case, it is crucial to link skills that can be seen through behavioral observations, direct monitoring, and how the work environment in schools contributes to teacher performance evaluations that may be helpful [9]. The principals' leadership, teacher competency, and motivation were all subjects of prior studies on teacher performance [10]. Studies by [11] tested the factors of visionary leadership and the school environment, and the results showed a significant positive effect. Another study identified the influence of school culture, commitment, training, and teacher satisfaction. In the digital industrial era, few teacher performance studies are still encouraged by the innovative behavior of teachers and their skills in using information technology. It is also important to see from the school work environment.

Therefore, the problem raised in this research is to fill the gaps in the factors that affect teacher performance with research questions: 1) What are the factors that consist of Teacher's Innovative Behavior, Information Technology Skill, and School Work Environment affect Teacher Performance in the digital era rope? 2) Which factors have an essential influence on teacher performance? Based on the previous explanation, this study assumes TIB, ITS, and SWE are essential factors discussed in improving teacher performance. This study will focus on how well these factors impact teacher performance. Thus, this investigation established a causal relationship.

2 Literature Review

2.1 Teacher Performance

Academics have defined performance as a set of behaviors in achieving organizational goals. Some experts use subjective judgment. Exploration of the performance construct is the first step to scientifically evaluating performance. The results show that performance is a multidimensional construct. Some researchers state that an individual realizes organizational goals in two different ways [12]. Performance is characterized as a set of

regulated organizational behaviors on the one hand and a set of spontaneous role behaviors on the other. Task performance is the first set of behaviors, while contextual performance is the last set of behaviors [13].

Performance is a set of actions and results related to organizational goals and strategies that are displayed by organizations, teams, or individuals in their work, including work results and work behavior [14];[15]. Performance is the sum of individual or organizational abilities, work status, and work results. It can be interpreted that teacher performance is a set of teacher abilities in carrying out their duties and responsibilities in the learning and education process so that their students graduate well.

2.2 Teacher's Innovative Behavior

Innovative conduct is a factor that has a big impact on performance; it can improve one's performance and aid in the institution's aims. This demonstrates how engaging in innovative activities improves teacher performance. Based on research done by several specialists, it can be concluded that innovative behavior has an impact on teachers' performance. Innovation is required, and it can be achieved through regular information addition from the most recent articles, training, seminars, and focus group discussions on organizational management. [16] stated that the more innovative a person is in their behavior, the better they will contribute to the organization and their performance will increase.

Innovative behavior of teachers is a collection of teacher activities to improve learning methods so that they will be easily accepted by students. Innovative behavior is a new way in teacher learning methods, especially in the digital era. TIB is a teacher's behavior aimed at the initiation and intentional recognition (in work roles, groups, or organizations) of new and useful ideas, processes, products, or procedures. Unlike creativity, TIB is explicitly intended to provide new benefits [17]. This is more of a clearer application and is expected to produce innovative outputs. Creativity can be seen as an important component of TIB, most clearly early in the innovation process when problems or performance gaps are recognized and ideas are generated in response to a perceived innovation need [18]. Here, various teacher innovative behavior that includes the initiation and implementation of ideas are discussed. The more persistent the teachers are in implementing ideas and innovating, the more they will improve their performance. Therefore, the proposed hypothesis is

H1: A teacher's innovative behavior increases teacher performance.

2.3 Information Technology Skills

The availability of information technology systems allows it to be used to access learning materials wherever they are as long as they can be accessed via the internet. It is very supportive of education. Therefore, face-to-face meetings are no longer needed for the teaching and learning process. [19] emphasized that everyone's need for information technology is present in the era of globalization. Information technology will make the

teaching and learning process simpler and faster. The current study examines task shifting more from the job task framework, where tasks are currently performed by teachers who interact with information technology in different ways. Therefore, it has the potential to cause the need for new skills to adapt to changes. It also investigates what types of skills are more helpful in today's increasingly computerized workplace [20].

Teachers will be increasingly performing by increasing their knowledge of information technology. In today's rapidly developing technological environment, teachers must be able to use technology to assist the learning process. By teaching students in the millennial era, performance can be improved by using technology effectively. This provides direction for the second hypothesis

H2: Information technology skills increase teacher performance.

2.4 School Working Environment

Previous studies have identified five categories of skills required in a work environment: 1) analytical skills, used in solving non-rule-based problems; 2) interactive skills, used in interacting with humans to obtain information, explain it, or influence others; 3) cognitive skills (routine), used in rule-based mental tasks; 4) manual-routine skills, used in physical tasks that can be well explained by rules; and 5) non-routine-manual skills for physical tasks that cannot be well explained by following fixed rules [21]. The more teachers are motivated to improve their performance in carrying out their responsibilities and obligations at work, the more their demands in carrying out learning activities are met. This is because someone will be more comfortable doing their job in an environment that is clean, comfortable, and meets the required standard of necessities. Different findings from the research of [22], which claims that the work environment does not affect employee performance were conducted in the hotel industry. This is because the work environment is not always important in improving employee performance. The working environment has a significant impact on job satisfaction.

K. Kuusisto (2011) states that the work environment is a physical environment that affects the performance, safety, and quality of employees. The work environment provides a sense of security and allows employees to work optimally, this can affect employee emotions. In this case, if the teacher enjoys his work environment, he will enjoy his time at work (in the school environment). Teachers will use their working time effectively and optimally which has an impact on high work performance. In addition to the physical environment in which the teacher works, the work environment includes the working relationship between fellow teachers and the relationship between the teachers and the principal. So the third hypothesis proposed is

H3: School working environment increases teacher performance.

From several descriptions that have been carried out by previous researchers related to the conceptual framework that examines the influence of TIB, ITS, and SWE on Teacher Performance, a research model is made as shown in Figure 1.

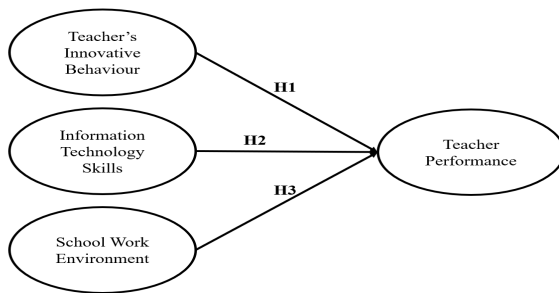


Fig.1. Hypothetical causal model

3 Research Method

In this study, the survey method was used. The three components of this method are questionnaire generation, respondents and sampling technique, and statistical analysis of findings.

3.1 Questionnaire Generation

Table 1. Questionnaire list of TIB

Variable (Source)	Variable Indicators	Item
Teacher's Inovatif Behavior (Jong & Hartog, 2010)	I always pay attention to problems that are not part of my job.	TIB1
	I always think about opportunities to improve innovatively	TIB2
	I am always looking for new methods, techniques, or work instruments.	TIB3
	I always come up with solutions to solve problems with new approaches.	TIB4
	I'm always finding new ways to get things done better	TIB5
	I always make my colleagues enthusiastic about innovative ideas.	TIB6
	I always try to convince people to support my innovative ideas.	TIB7
	I always introduce innovative ideas into work practice.	TIB8
	I always contribute to the implementation of new ideas at work.	TIB9
	I always try to develop new things.	TIB10

The operational definition of TIB is the perception of school teachers towards the pursuit of new things in work ideas including collaboration with colleagues in solving common problems, including the strategic performance of teachers. TIB is measured by 10 statements, where the measurement tool is modified from the study of Jong & Hartog (2010). ITS consists of 7 indicators that were compiled referring to the study of [24].

Table 2. Questionnaire list of ITS

Variable (Source)	Variable Indicators	Item
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Information Technology Skills (Russell, G., Finger, G., & Russell, N., 2000).	The Information System (Software) currently implemented is very easy to use so I can complete my tasks better.	ITS1
	The computer equipment (hardware) used today is complete so that it supports the application of information technology.	ITS2
	My understanding of using information technology through computers is good so I can use the application well.	ITS3
	The local computer network (Intranet) currently installed is well connected with all work units so that the process of sending information becomes fast and easy.	ITS4
	In the process of sending data or information, the time required is relatively fast and timely.	ITS5
	The installed information system cannot be misused by unauthorized parties.	ITS6
	With the application of information technology, I can carry out services faster and on time.	ITS7

In the review, [25] reaffirmed the importance of working conditions in the school environment, so in this study, the operational definition of SWE is the teacher's perception of SWE which ensures the quality of teacher work: adequate resources, decent and safe workload, collegial cooperation, opportunities for professional development, leadership support, harmony with co-workers, and decision-making opportunities. SWE includes 8 indicators inspired by the research of [26]. While the TP includes 6 modified statements from [27]. The respondents were asked to fill in using a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree. This scale was chosen following previous studies [3];[28]. Tables 1-4 show the questionnaire items used in this study.

Table 3. Questionnaire list of SWE

Variable (Source)	Variable Indicators	Item
School Work Environment (Toropova, A., Myrberg, E., & Johansson, S., 2021).	The air circulation system where I work is operating well.	SWE1
	I feel comfortable with the temperature of the room where I work.	SWE2
	The lighting where I work is sufficient so that my work is not hampered.	SWE3
	The place I work provides good restroom facilities.	SWE4
	The atmosphere where I work is quite harmonious.	SWE5
	The security level of the workspace makes me feel safe at work.	SWE6
	My school principal often motivates me, so it makes me excited at work.	SWE7
	My co-workers respect each other.	SWE8

Table 4. Questionnaire list of TP

Variable (Source)	Variable Indicators	Item
Teacher Performance (Robbins, S. P., & Judge, T., 2012)	I can complete my work meticulously.	TP1
	I try to work to meet the set targets.	TP2
	I start work, rest, and go home at the appointed time.	TP3
	In my work, I do not delay the work that has been given.	TP4
	I work hard even if supervised or unsupervised.	TP5
	I have a high commitment to getting the job done.	TP6

3.2 Respondents and sampling technique

The data collection was conducted by disseminating questionnaires in the format of Google forms, which were disseminated for a duration of 6 weeks. Electronic questionnaires were circulated with the help of the Public Relations Unit at the school. The object of the study was a vocational high school in Yogyakarta, Indonesia which became a vocational pilot school. Closed questionnaires were completed by respondents. A total of 162 teachers were allowed to fill out a questionnaire (using the saturated sample technique), but 104 teachers were willing to fill out the questionnaire (response rate 64%).

This school is also an attraction as a model vocational school. The students at this school are selected students with a strict level of selection. The performance of teachers in this school is very challenging in managing education so that the school can remain superior. Therefore, it is certainly interesting to examine in depth how the influence of innovative behavior of teachers, information technology skills, and school work environment on the performance of teachers in vocational schools.

3.3 Data Analysis Technique and Hypothesis Testing

The data analysis methodology takes advantage of the available statistical methods because the data is quantitative. Multiple Regression Analysis will be the method of data analysis used in this study.

4 Results

Table 5 shows the respondents' descriptors of their age, gender, education, and employment duration. According to the table, the majority of teachers who responded at these schools are senior teachers. There are 38.46% of teachers over the age of 51 and 29.81% between the ages of 41 and 51. This is also obvious from the 62 (59.62%) respondents who had worked for more than 15 years. In terms of education, 20.19% of teachers had master's degrees, whereas 79.81% of total respondents had bachelor's degrees.

Table 5. Characteristics of teachers surveyed

Age	Number (%)	Working Period	Number (%)
21- <31	27 (25.96%)	< 1 year	18 (17.31%)
31- <41	6 (5.77%)	1-5 years	13 (12.50%)
41- <51	31 (29.81%)	6-10 years	4 (3.85%)
>= 51	40 (38.46%)	11-15 years	7 (6.73%)
		> 15 years	62 (59.62%)
Gender		Education	
Male	50 (48.08%)	Bachelor	83 (79.81%)
Female	54 (51.92%)	Master	21 (20.19%)

4.1 Descriptive Analysis of the Data

Input data from the questionnaire results are presented with a recapitulation of the results of the answers with the intervals shown in Table 6.

Table 6. Interpretation of respondent's answer classification

Interval	Description
1.00-1.86	very low
1.87-2.72	low
2.73-3.58	rather low
3.59-4.44	average
4.45-5.30	rather high
5.31-6.16	high
6.17-7.00	very high

From the results of respondents' responses to teachers' innovative behavior, it is known that the average respondent's answer is 5.26, which is in the rather high category (4.45 – 5.30). while other variables (ITS, SWE, and TP) are in the "high" category. this can be seen in Table 7.

4.2 Validity and reliability testing

The next stage is testing the validity and reliability of the respondents' answers. Testing the validity using the value <0.05 , the results show that all items forming the variable have a significant value below 0.05. Therefore, it can be said that all items are valid.

Reliability indicates the extent to which a measuring instrument can give relatively the same results. The critical value is a measure if the value is above 0.7 [29]. The results of the reliability test showed that all variables have Cronbach's Alpha value > 0.7 so it can be concluded that all research variables are reliable, and can be used as research instruments. The results of reliability testing can be seen in Table 8.

Table 7. Descriptive Analysis

Variable	Item	Mean	Variable	Item	Mean
Teacher's Innovative Behavior	TIB1	4.61	School Work	SWE1	6.01
	TIB2	5.79	Environment	SWE2	5.85
	TIB3	5.46		SWE3	6.05
	TIB4	5.24	SWE4	5.39	
	TIB5	5.30	SWE5	5.82	
	TIB6	5.16	SWE6	5.81	
	TIB7	5.28	SWE7	5.78	
	TIB8	5.23	SWE8	6.04	
	TIB9	5.16			
	TIB10	5.38			
Mean total		5.26	Mean total		5.84
Information Technology Skills	ITS1	5.51	Teacher Performance	TP1	5.59
	ITS2	5.55		TP2	5.84
	ITS3	5.35	TP3	5.95	
	ITS4	5.63	TP4	5.67	
	ITS5	5.75	TP5	6.10	
	ITS6	5.44	TP6	6.03	
	ITS7	5.71			
Mean total		5.56	Mean total		5.84

Table 8. Reliability Test

Variable	Cronbach's Alpha	Information
TIB	0.928	Reliable
ITS	0.928	Reliable
SWE	0.894	Reliable

TP	0.891	Reliable
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4.3 F Test and Hypothesis

Table 6 presents the results of the model test, where the significant value is 0.000. This means that the variables TIB, ITS, and SWE have a simultaneous (together) effect on TP. This means that this research model is fit so that all independent variables have a joint effect on the dependent variable.

Table 9. F Test

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	646.527	3	215.509	18.865	.000 ^b
Residual	1142.358	100	11.424		
Total	1788.885	103			

a. Dependent Variable: TP

b. Predictors: (Constant), TIB, ITS, SWE

Table 9 shows that all variables have a positive and substantial impact, as indicated by the sig. <0.05. This demonstrates how factors like Teacher’s Innovative Behavior, Information Technology Skills, and School Work Environment impact how well Teacher Performance.

Table 10. Hypothesis Test Results

Variable	B	t	Sig.	Adjusted R Square
TIB	0.116	2.515	0.014	0.342
ITS	0.158	2.546	0.012	
SWE	0.221	3.246	0.002	

The results of the coefficient of determination test produce an R Square value of 0.342, which means that the TP variable can be explained by the TIB, ITS, and SWE variables of 34.2%, while the remaining 65.8% is explained by other variables.

5 Discussion

The results of the descriptive analysis show that the TIB value is included in the rather high category. It can be interpreted that the innovative behavior of teachers has tended to be good. If we look at the average per item of respondents' answers, there are three items whose value is above 5.31; consisting of TIB1 ("I always pay attention to problems that are not part of my job"), TIB2 ("I always think about opportunities to improve innovatively"), and TIB 10 ("I always try to develop new things"). When viewed from the results of hypothesis testing, it shows that the significance value of TIB is greater than the other two independent variables. However, the results are positive and significant. So TIB affects teacher performance. This study is in line with the research of [30]and [16] which also found that innovative behavior had a positive effect on performance.

This study shows that the average respondent's answer regarding information technology skills is in the high category. This means that teachers in schools already have good information technology skills. Environmental changes related to technological advances can be implemented in the school environment. The results of this study succeeded in proving

that the use of skilled information technology is directly proportional to the performance of teachers, meaning that the better the skills of information technology, the better the performance of teachers in schools. This study is in line with the research of [31], and [32] who also found that information technology had a positive effect on employee performance.

This research discloses that the average value of the school work environment is in the high category, meaning that the school work environment perceived by the teachers is good. The results of hypothesis testing indicate that the influence of the school work environment is positive and significant. This indicates that a better schoolwork environment will further improve teacher performance. This research supports previous studies from [33], [26], and [34] show that a good school work environment has a positive and significant effect on teacher performance in schools.

Every educational organization desires long-term implementation of the teaching and learning process. The term "sustainability" refers to how teachers constantly innovate in their jobs. Furthermore, the advancement of technology and information that is always renewable, encourages teachers to improve their skills in utilizing information technology in the learning process. The existence of the school environment is also constantly improved to ensure the implementation of the teaching and learning process properly. This study aims to examine the effect of teachers' innovative behavior, information technology skills, and school work environment on teacher performance. The research question posed regarding the factors driving teacher performance has been proven, that all the factors driving the sustainability of teacher performance show positive and significant results.

The findings of the test on the three independent variables show that the school work environment is the most influential factor. The physical environment, the interaction with the teacher employees at the school, and a solid relationship with the principal are all examples of the school work environment. However, this study indicates that the school work environment greatly supports teacher performance.

6 Conclusion

This research facilitates the verification of factors that improve teacher performance. The individual performance of a teacher is related to the level of success or achievement set, both in terms of certain goals and targets achieved. Performance is also a result of the work of the tasks that must be carried out. For the sustainability of a school organization, it is important to pay attention to the factors that drive teacher performance. This study has presented that all the factors that drive teacher performance prove to have an effect, either simultaneously or partially. Partially, the school work environment is the most powerful variable affecting teacher performance.

The implications of the study findings suggest that the school work environment is an important factor in efforts to improve teacher performance. This study views the school work environment which includes the physical environment, security, and attention from leaders, and colleagues as the main factors that must be considered. The managerial implication of this study is that it is important to implement programs to maintain the work environment and good relations in managing human resources in the organizational environment. The theoretical implication of this study is that the innovative behavior of teachers, information technology skills, and school work environment are important factors in improving teacher performance. These are factors that are updated for organizations in the face of environmental changes. Therefore, it is necessary to pay attention to maintaining the sustainability of the school organization for the future.

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