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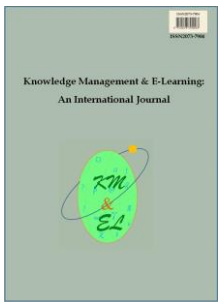
Virgana Virgana
Merry Lapasau
Universitas Indraprasta PGRI, Indonesia



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Elevating teachers' performance through locus of control, leadership style, environmental factors, and work motivation

Virgana Virgana*

Post graduate Mathematics and Natural Sciences Department
Universitas Indraprasta PGRI, Indonesia
E-mail: virganaunindra@gmail.com

Merry Lapasau

Post graduate Faculty, Department of Indonesian Language Education
Universitas Indraprasta PGRI, Indonesia
E-mail: mlapasau@gmail.com

*Corresponding author

Abstract: The roles of teachers as educators are to impart knowledge and skills to students, as well as develop their mental character. Therefore, this study aims to analyze the influence of locus of control, leadership style, environmental factors, and work motivation on teachers' performance in guiding students toward a higher level of education. A sample size of 720 high school teachers was used to explore the perceptions of locus of control, leadership style, environmental factors, and work motivation on performance. Furthermore, the data were analyzed using the Smart-Partial Least Square software. The results showed a direct effect of locus of control, leadership style, and environmental factors on work motivation. Moreover, there was an effect of locus of control, environmental factors, and work motivation on teachers' performance. These results highlight the necessity for qualified teachers, which the government of Indonesia needs to fulfill in order to achieve a better education across the country.

Keywords: Locus of control; Leadership style; Environmental factors; Work motivation; Teachers' performance

Biographical notes: Virgana Virgana is an Associate Professor of Post graduate Mathematics and Natural Sciences Department, Universitas Indraprasta PGRI Indonesia. Graduate from University of Virginia, USA and doctor degree of State Jakarta University in 2010. His research interests in Mathematics Education, Special education and Education Management.

Dr. Phil. Merry Lapasau M.A. is an Associate Professor of Post graduate Indonesian Language Department, Universitas Indraprasta PGRI Indonesia was born in Jakarta, Indonesia. She completed a Master of Arts (MA) in Germanistics, Applied Linguistics, and Pedagogics from Siegen University, Germany in 2002 and subsequently obtained a Doctor of Germanistics degree from the University of Siegen, Germany, in 2005. She has been involved in multiple disciplinary research in the area of translation, linguistics, education, and technology-enhanced learning. She is now lecturer at university of Indraprasta PGRI, Jakarta, Indonesia.

1. Introduction

The current situation in Indonesia shows universities can only accommodate around 38% of high school and vocational school graduates annually (Dikti, 2018). This creates a growing need for competent and effective teachers in society, as only school graduates can continue to higher education. To address this issue, schools are expected to provide a quality learning process that facilitates academic gain (Mutohar & Trisnantari, 2020).

A quality school administration is not only influenced by teachers' performance (TP) but also backed by other factors outlined in the National Education Convention. These factors include the curriculum, learning process, graduate capability, teachers and education staff, facilities and framework, administration, fiscal, and education assessment (The President Republic of Indonesia, 2005a). However, this study examined practical teacher standards as the only component of the national education standards in Indonesia.

The quality of education in schools is influenced by several variables, such as the principal's leadership in managing resources, processes, and motivation (Fitrah, 2017). Furthermore, leadership nature, administrative support, networking, and a useful environment determine teachers' performance (Fauzan et al., 2023). Teachers are successful in creating a conducive environment when they provide services that meet the needs of the school's residents (Magulod, 2017). According to Jamal (2014), leadership style in the school environment is vital in improving performance. Meanwhile, Magulod (2017), suggested that both internal and external collaborative efforts are the path to achieving effective schools. Gibson et al. (2012) stated that the variables affecting performance and job satisfaction are followers, locus of control, experience, ability, leadership style, environmental factors, tasks, formal authority system, workgroup, and motivation. The current study focuses on five specific variables, namely locus of control (LC), leadership style (LS), environment factor (EF), work motivation (WM), and teachers' performance (TP).

The influence of locus of control on job performance has produced mixed results in previous studies. Some studies showed a significant correlation between the two variables (Vishal, 2013; Kriswantini & Sososutiksno, 2020; Rachman et al., 2022), while others found no significant correlation (Siregar & Nahumury, 2015; Rakhman et al., 2021). A study on high school teachers in Jakarta and its surroundings concluded that work motivation has no effect on teachers' achievement (Mulyana et al., 2021). Embang et al. (2022) also concluded that work environment does not affect the achievement of secondary school teachers in the Philippines. In contrast, a study in Edo and Delta states of Nigeria found that work motivation influenced the achievement of Educators (Owenvbiugie & Ekhaise, 2019). In addition, work achievement influenced the independence of vocational high school teachers in East Java (Wahyudi et al., 2022).

To understand the variations of these results, studies are expected to examine the potential role of other variables that affect teachers' performance. In the context of the public school system in Indonesia, there is a limited study that examines the role of intervening variables, specifically work motivation in schools. Therefore, this study utilized the concepts of leadership roles, work environments, and motivation to understand their influence on teachers' performance. Notably, the study apparatus were developed based on variable indicators. The results were analyzed using Exploratory Factor Analysis to identify similar items on the dimensions. Also, the variables were obtained through a questionnaire filled out by stakeholders, and the five variables with

the highest number of votes were selected. In contrast to other surveys that used only one software program, this study utilized two software packages, namely SPSS 24 and Smart-PLS. Smart-Partial Least Square was used to obtain valid and reliable data with a sig of > .70. This study is expected to shed some light on the field of education in Indonesia.

The four variables were analyzed to resolve their influence on teachers' performance through the following study questions:

1. Do teachers' locus of control, leadership style, and environmental factors directly influence their work motivation?
2. Do teachers' locus of control, leadership style, environmental factors, and work motivation directly influence their performance?
3. Do teachers' locus of control, leadership style, and work environment indirectly influence their performance through work motivation?

2. Literature review

2.1. Teachers' performance

According to Teodorović (2009), motivation, stability, and the principal's leadership style, influenced teachers' performance. Furthermore, a good school environment, the principal's leadership, teachers' professionalism, and a healthy relationship between the school and home are essential for enhancing teachers' performance (Magulod, 2017). Professional teachers have a clear understanding of their duties and responsibilities (Hartiwi et al., 2020). Moreover, Walker (2008) listed the twelve characteristics of effective teachers, namely preparedness, optimism, high expectations, creativity, fairness, approachability, cultivating a sense of belonging, empathy, playfulness, respect for students, forgiveness, and admitting aberration. These characteristics are similar to the four indicators of teacher competencies, namely professional, pedagogic, personal, and social (The President Republik of Indonesia, 2005b). Teachers are expected to possess proficiency in information and communication technology (Maksimović & Dimić, 2016). Therefore, teachers' performance refers to a specific set of behaviors demonstrated while working independently or in groups to achieve the targets outlined in their professional capability, pedagogic, personal, communal, mastery of information, and communication technology.

2.2. Locus of control

Locus of control is a belief that an individual's behavior or that of others is influenced by job performance. According to this concept, humans can be classified as having an internal or external locus of control. People who have an internal locus of control believe their success is a result of effort. Meanwhile, those with an external locus of control believe their success is dependent on others' efforts (Labhane et al., 2015). Employees with an internal locus of control tend to work alone and are highly motivated (Kalil et al., 2019). Therefore, they are a significant asset in achieving organizational performance (Sundjoto, 2017). Individuals with high locus of control are more likely to perform better (Bahçekapılı & Karaman, 2020).

Based on this description, locus of control can be defined as a specific pattern of employee behavior when working individually or in groups to achieve goals. Such

behaviors include confidence, self-initiative, cooperation, responsibility, and hard work. The study hypotheses are as follows:

H1: Locus of control has a direct effect on work motivation.

H2: Locus of control has a direct effect on Teachers' performance.

2.3. Leadership style

Leadership styles can range from autocratic to democratic approaches. Even though some leaders adopt a more autocratic way to manage their subordinates, others use a very democratic approach. Some others adopt a combination of both styles, falling somewhere between the two extremes. Various approaches to leadership styles are described in a continuum of autocratic-democratic approaches (Quible, 2002). According to Colovic (2022), a leadership style can vary depending on the institution in which it is implemented (Fries et al., 2021). Moreover, it can significantly affect how subordinates work (Rabiul & Yean, 2021).

Based on this description, leadership style can be defined as a distinct pattern of a leader's behaviour in directing the subordinates, either individually or in groups, towards achieving the set goals. It is characterized by traits, such as self-confidence, respect for subordinates, expertise in directing, openness in decision making, and communication regarding all policies. The study hypotheses are as follows:

H3: Leadership style has a direct effect on work motivation.

H4: Leadership style has a direct effect on teachers' performance.

2.4. Environmental factors

The working environment refers to an organizational condition that provide complete structures and infrastructure, along with the social aspects, enabling workers to perform their duties in a profitable way. The main environmental factors include lighting, noise, temperature, and air quality (Bai & Wicaksono, 2020; Stelmach et al., 2016). There are three essential aspects of the work environment, namely the description of the workplace conditions, the location of the workplace, and the relevant characteristics of the workplace, such as hazards and noise levels (Ivancevich, 2010). The work environment includes infrastructure, communication, and technological support (Mullins, 2007).

Based on the above discussion, it can be concluded that the working environment encompasses the physical setting and an atmosphere that facilitate the execution of work. The key indicators of favorable working environment include the comfort of the room, the completeness of work equipment, a comfortable working atmosphere, effective communication among organizational members, and between superiors and subordinates. The study hypotheses are as follows:

H5: Environmental factor has a direct effect on work motivation.

H6: Environmental factor directly affects teachers' performance.

2.5. Work motivation

Work motivation is essentially the urge to work, and it is triggered by internal and external factors through individual psychological processes, with the aim of achieving

specific goals. Furthermore, motivation is a psychological process that forms a behavioral response to meet individuals' ultimate needs (Cromwell et al., 2020). Motivation can vary depending on the level of desire to achieve it, and is classified into two types, namely intrinsic and extrinsic (Demircioglu & Chen, 2019; Chai et al., 2017; Saether, 2019). According to Ahmed et al. (2021), it is an attitude and value that drives a person to act and be goal-oriented. Maslow's theory stated that humans are motivated based on their level of needs, including self-realization, self-esteem, social, security, and physiological needs (Shoib et al., 2022).

Work motivation is an impulse that arises in a person striving to achieve results, with indicators, such as eagerness to work, desire for rewards, liking work with personal responsibility, the desire to achieve work standards as well as to complete the task instantly. The study hypotheses are as follows:

H7: Work motivation has a direct effect on teachers' performance.

H8: Locus of control indirectly affects work motivation on teachers' performance.

H9: Leadership style has an indirect effect through work motivation on teachers' performance.

H10: The environmental factor has an indirect effect through work motivation on teachers' performance.

3. Conceptual model

The following are the points needed to be an effective teacher: (1) having high expectations of all students, (2) contributing to positive academics and diverse resources, (3) contributing to the development of classrooms and schools that value diversity or civic thinking, (4) as well as collaborating with others (Little et al., 2009). Moreover, effective teachers are expected to master four competencies identified by The President Republik of Indonesia (2005b), and should have proficiency in ICT (Maksimović & Dimić, 2016). The effectiveness of teachers' performance can be influenced by locus of control and work motivation (Kalil et al., 2019), as well as leadership style and work environment (Rahardjo, 2014; Rachmah et al., 2018). Based on the recommendations of relevant results, this study will use a conceptual model shown in Fig. 1 to analyze the exogenous variables.

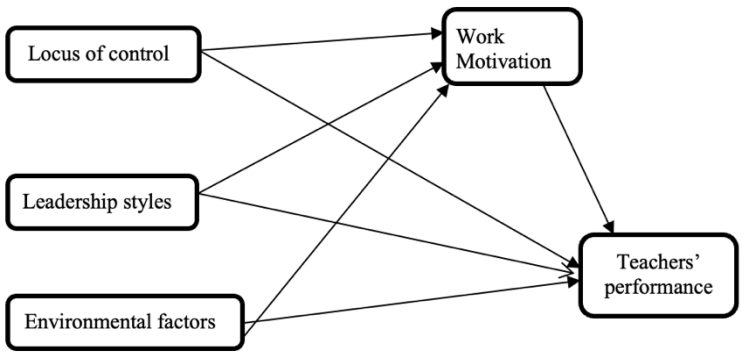

Fig. 1. Conceptual model

3.1. Study design

This is a quantitative study, and the survey and data analysis were conducted using a path analysis model and Smart-PLS software. Furthermore, the sample data validation was carried out using Smart-PLS bootstrapping. The valid data are expected to meet the criteria of $r > .70$, therefore those with $r < .70$ were excluded from further analysis. This study was conducted from October 2020 to April 2021 during the Covid-19 pandemic. The data were obtained using Google Form distributed to 800 teachers with public employee status. A total of 720 questionnaires were declared valid with complete answers.

3.2. Population and sampling

A random sampling technique was used to select 720 public high school teachers as sample. An adequate sample size for testing these hypotheses will result in an accurate analysis (Andrade, 2020). The teachers were selected from three provinces, namely Jakarta, West Java, and Tangerang, and were specifically those with civil servant status at state high schools.

3.3. Variables and instruments

The variables were determined based on a survey of stakeholders in the field of education, which consist of 50 principals, 30 school superintendents, 20 parent-teacher member associations, and 10 officials from the education office. Through a questionnaire containing various variables, one independent variable was chosen from a range of variables that can affect work performance, namely subordinate characteristics, locus of control, experience, ability, leadership style, environment factors, and work motivation (Gibson et al., 2012). Meanwhile, four independent variables were identified from the questionnaire results, based on the highest number of responses. These variables are locus of control (29%), leadership style (23%), environment factor (17%), and work motivation (15%).

A census survey with a Likert scale was used as the study instrument. Each variable indicator consists of four items with five answer choices, namely 5 (fully admit), 4 (admit), 3 (a little agree), 2 (differ), and 1 (wholly differ). This instrument consists of five variables, namely, locus of control (V1), leadership style (V2), environment factor (V3), work motivation (V4), and performance (V5). The Smart-PLS analysis employed codes for each number of questions. For example, V323 refers to the third variable (environment) in the second indicator (completeness of work equipment) for the third question (schools provide laptops to teachers for online learning).

Tables 1-5 present the blueprint of the instrument grid for locus of control, leadership style, environmental factors, work motivation, and teachers' performance.

Table 1
Blueprint of locus of control instrument

No.	Dimension	Code item number	Num
1.	Self-control	V.111; V.112; V.113; V.114	4
2.	Teamwork	V.121; V.122; V.123; V.124	4
3.	Initiative	V.131; V.132; V.133; V.134	4
4.	Responsibility	V.141; V.142; V.143; V.144	4
5.	Hard-working	V.151; V.152; V.153; V.154	4
Total			20

Table 2
Blueprint of leadership style instrument

No.	Dimension	Code Item number	Num
1.	Confidence	V.211; V.212; V.213; V.214	4
2.	Subordinate respect	V.221; V.222; V.223; V.224	4
3.	Expertise in directing	V.231; V.232; V.233; V.234	4
4.	Openness in decision making	V.241; V.242; V.243; V.244	4
5.	Flexibility in communicating	V.251; V.252; V.253; V.254	4
Total			20

Table 3
Blueprint of environment factor instrument

No.	Dimension	Code Item number	Total
1.	Room comfort	V.311; V.312; V.313; V.314	4
2.	Work equipment	V.321; V.322; V.323; V.324	4
3.	Comfortable working atmosphere	V.331; V.332; V.333; V.334	4
4.	The convenience of communication between organization members	V.341; V.342; V.343; V.344	4
5.	The convenience of communication between superiors and subordinates	V.351; V.352; V.353; V.354	4
Total			20

Table 4
Blueprint of work motivation instrument

No.	Dimension	Code Item number	Total
1.	Excited at work	V.411; V.412; V.413; V.414	4
2.	Get rewards	V.421; V.422; V.423; V.424	4
3.	Enjoying work with personal responsibility	V.431; V.432; V.433; V.434	4
4.	Desire to achieve work standards	V.441; V.442; V.443; V.444	4
5.	Desire to quickly complete the task	V.451; V.452; V.453; V.454	4
Total			20

Table 5
Blueprint of teachers' performance instrument

No.	Dimension	Code Item number	Total
1.	Professional competence	V.511; V.512; V.513; V.514	4
2.	Pedagogic competence	V.521; V.522; V.523; V.524	4
3.	Personal competence	V.531; V.532; V.533; V.534	4
4.	Social competence	V.541; V.542; V.543; V.544	4
5.	ICT competence	V.551; V.552; V.553; V.554	4
Total			20

3.4. Exploratory factor analysis

The designed study instrument had a total of 100 items. Exploratory Factor analysis (EFA) was subsequently conducted to identify common factors based on the items' similarity in the variables to be measured (Watkins, 2018). Furthermore, the EFA analysis obtained a repositioning of items that resulted in new dimensions of each variable. All variables obtained the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) of > .50 with a significant value of < .05. Table 6 shows the changes in the number of dimensions for each variable.

Table 6
Final result of instrument composition

No	Variable	Number of dimensions before EFA	Number of dimensions after EFA	Information
1	LC	5	3	Encoding items according to new dimensions
2	LS	5	3	Encoding items according to new dimensions
3	EF	5	3	Encoding items according to new dimensions
4	WM	5	4	Encoding items according to new dimensions
5	TP	5	3	Encoding items according to new dimensions

4. Results

The demographic information of the study sample is shown in Table 7.

Table 7
Demographic information

Description	Category	Frequency	%
School region	Jakarta	248	34.5
	West Java	333	46.3
	Banten	139	19.2
Gender	Male	278	38.6
	Female	442	61.4
Age	24 – 30.9	217	30.1
	31 – 37.9	175	24.3
	38 – 44.9	146	20.3
	45 – 51.9	116	16.1
	52 – 58.9	66	9.2
Teaching experience	< 4.9 Years	174	24.2
	5 – 10.9 years	222	30.8
	11 – 16.9 years	140	19.4
	– 22.9 years	111	15.5
	> 23 years	73	10.1
Academic qualification	Bachelor	471	65.4
	Master degree	246	34.2
	Doctor	3	0.4

4.1. Validation and reliability tests

Fig. 2 shows the validation and reliability tests using the calculation results of the PLS algorithm based on a new dimension (after EFA).

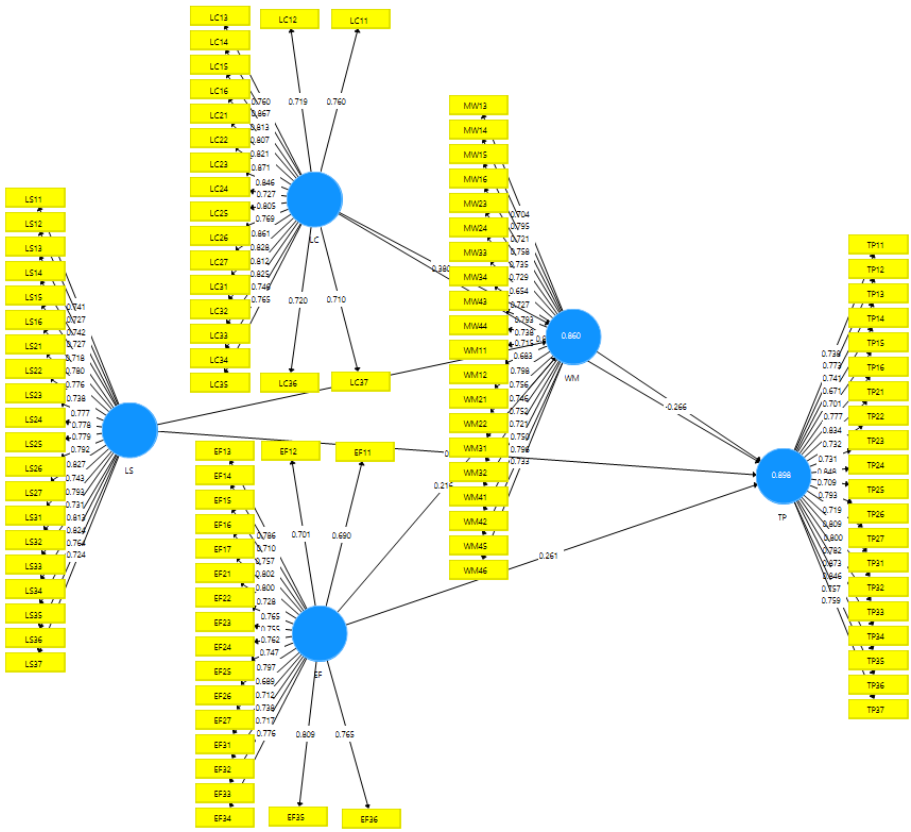

Fig. 2. Structural PLS agorithm analysis results model

According to the path coefficient output in Fig. 2, only indicators with a loading factor coefficient of $r > .70$ were further analyzed, while data with $r < .70$ were not used in the study. The validity results of the data are presented in tables 8-12.

Table 8
Loading factor coefficient for a locus of control

Coefficient loading factor	Confident and collaborate	Own initiative	Hard-working
$r > .70$	LC.11 = .760 LC12 = .719 LC.13 = .760 LC.14 = .867 LC.15 = .813 LC.16 = .807	LC.21 = .821 LC.22 = .871 LC.23 = .846 LC.24 = .727 LC.25 = .805 LC.26 = .769 LC.27 = .861	LC.31 = .828 LC.32 = .812 LC.33 = .825 LC.34 = .746 LC.35 = .765 LC.36 = .720 LC.37 = .710
$r < .70$	Nil		

Table 9
Loading factor coefficient for leadership style

Coefficient loading factor	Communicating	Expertise in directing	Flexibility in communicating
	LS.11 = .741	LS.21 = .776	LS.31 = .743
	LS.12 = .727	LS.22 = .738	LS.32 = .793
r > .70	LS.13 = .742	LS.23 = .777	LS.33 = .731
	LS.14 = .727	LS.24 = .778	LS.34 = .813
	LS.15 = .718	LS.25 = .779	LS.35 = .824
	LS.16 = .780	LS.26 = .792	LS.36 = .864
		LS.27 = .827	LS.37 = .724
r < .70	Nil		

Table 10
Loading factor coefficient for environment

Coefficient loading factor	Completeness of information technology equipment	Comfortable working atmosphere	Completeness of work equipment
	EF.12	EF.21	EF.31
	EF.13	EF.22	EF.32
r > .70	EF.14	EF.23	EF.33
	EF.15	EF.24	EF.34
	EF.16	EF.25	EF.35
	EF.17	EF.26	EF.36
r < .70	EF.11	EF.27	

Table 11
Loading factor coefficient for work motivation

Dimension coefficient loading factor	Desire to achieve working standards	Desire to complete the task immediately	Eagerness to work	Love work with personal responsibility
	WM11	WM.21	WM.31	WM.41
	WM.13	WM.22	WM.32	WM.42
r > .70	WM.14	WM.23	WM.33	WM.43
	WM.15	WM.24	WM.34	WM.44
	WM.16			WM.45
				WM.46
r < .70	WM.12		WM.33	

The subsequent analysis used 95 valid data points and applied the Smart PLS bootstrap method. The analysis included evaluating the reliability of the data through Cronbach's Alpha (CA), Composite Reliability (CR), and Average Variance Extracted (AVE), as well as examining the magnitude of the direct and indirect effects. The reliability of the data is presented in Table 13.

Table 12
Loading factor of coefficient for teachers' performance

Dimension coefficient loading factor	Professional competence	Social competence	Personal and ICT competencies
	TP.11	TP.21	TP.31
	TP.12	TP.22	TP.32
$r > .70$	TP.13	TP.23	TP.33
	TP.15	TP.24	TP.34
	TP.16	TP.25	TP.35
		TP.26	TP.36
		TP.27	TP.37
$r < .70$	TP.14		

Table 13
Reliability of data

No	Variable	Cronbach's alpha	Composite Reliability	AVE
1	Locus of control	.960	.963	.564
2	Leadership style	.969	.971	.629
3	Environment	.963	.966	.586
4	Work motivation	.964	.967	.595
5	Teachers' performance	.972	.975	.658

Table 13 shows the Cronbach's Alpha and Composite reliability values of $r > .70$ as well as Average Variance Extracted (AVE) values of $r > .50$. Therefore, all indicators consistently measure their construction, allowing the study to proceed. It is worth noting that CR is more justifiable than CA (Fauzi, 2022).

4.2. Hypothesis test results

The direct and indirect effects of exogenous variables on endogenous variables were determined by the coefficient tests conducted on each substructure. Also, a hypothesis is accepted when the PLS bootstrapping calculation analysis has a *p*-value of < .050, as shown in Table 3. This shows the exogenous variables have a significant effect on the endogenous variables.

The next step involves calculating the coefficient of T-Statistics for hypothesis testing. Fig. 3 shows the calculation results of Smart PLS Bootstrapping produced T statistics, while Tables 14 and 15 respectively provide a summary of the direct and indirect effect calculation.

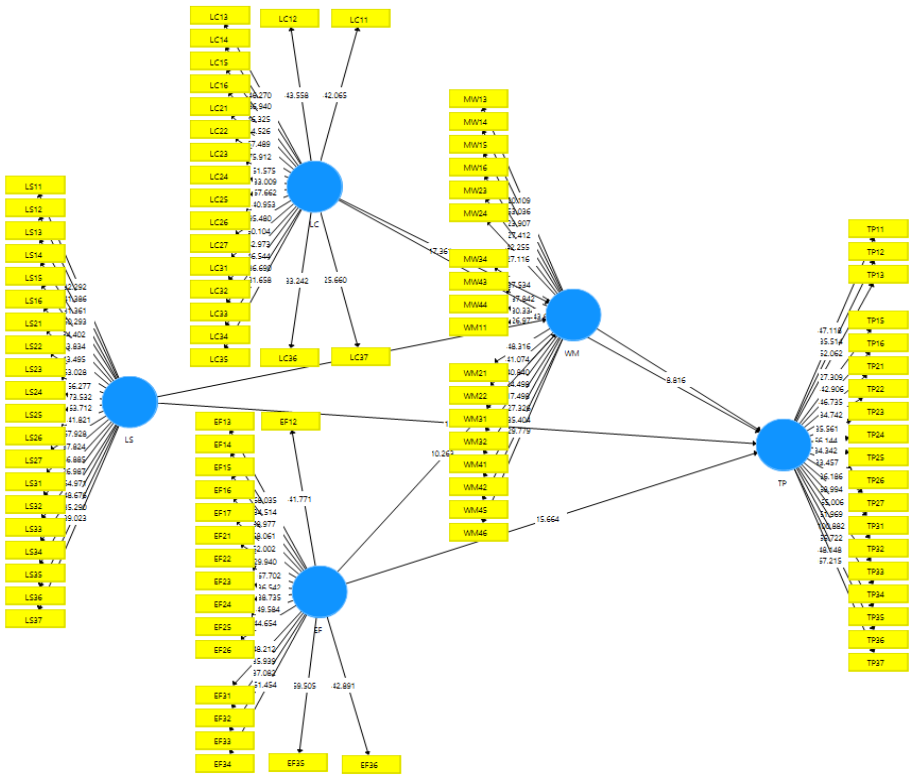

Fig. 3. The Result of Bootstrapping for locus of control (LC), leadership style (LS), environmental factors (EF), work motivation (WM), and teachers' performance (TP)

Table 14
The direct effect between two variables

Hypotheses	Path	Original sample	Standard deviation	*T*-statistics	*P*-value < .050	Result
H1	LC→WM (*p*-41)	0.428	0.031	13.639	.000	Accepted
H2	LC→TP (*p*-51)	0.856	0,016	54.708	.000	Accepted
H3	LS→WM (*p*-42)	0.348	0.018	19.694	.000	Accepted
H4	LS→TP (*p*-52)	-.025	0.022	1.124	.261	Not accepted
H5	EF→WM (*p*-43)	.141	0.022	5.304	.000	Accepted
H6	EF→TP (*p*-53)	.253	0.017	14.888	.000	Accepted
H7	WM→TP (*p*-54)	.114	0.011	9.933	.000	Accepted

Table 14 shows the direct and indirect effects among variables as obtained from the PLS bootstrapping analysis. Significant *p*-value of < .05 was found for six variables, indicating that there were six significant influences of exogenous variables on the endogenous, while answering the first and the second study questions as follows:

First, the LC has a direct effect on WM. The analysis obtained a t-statistic value of 13.639 and a *p*-value of 0.000 < 0.05 (sig. level), indicating that LC directly affects

WM. In other words, increased locus of control positively influenced teachers' work motivation.

Second, the LC has a direct effect on TP, which is proven by the t-statistics value of 54.708 and a *p*-value of 0.000 < 0.05 (sig. level). This shows the implementation of LC will have a positive influence on TP.

Third, LS has a direct effect on WM, which is proven by the t-statistic value of 19.694 and a *p*-value of 0.000 < 0.05 (sig. level). This indicates that an increase in LS will positively influence teachers' work motivation.

Fourth, LS has a direct effect on TP, which is proven by the t-statistic value of 1.124 and a *p*-value of .261 > 0.05 (sig. level). This indicates that the implementation of an improved LS does not positively affect TP.

Fifth, EF has a direct effect on WM, evidenced by the t-statistics value of 5.304 and a *p*-value of .000 < 0.05 (sig. level). This indicates that the implementation of environmental factors during the pandemic has a positive influence on work motivation.

Sixth, EF directly affects TP, which is proven by the t-statistics value of 14.888 and a *p*-value of 0.000 < 0.05 (sig. level). This indicates that the implementation of environmental factors has a positive influence on teachers' performance.

Seventh, WM has a direct effect on TP, which is proven based on the t-statistics value of 9.933 and a *p*-value of 0.000 < 0.05 (sig. level). This indicates that the implementation of work motivation positively affects teachers' performance.

Table 15
The indirect effect

Hypothesis	Path	Original sample	Standard deviation	*T*-statistics	*P*-value <.050	Result
H8	LC→WM→TP (*p*-541)	0.049	0.008	6.384	0.000	accepted
H9	LS→WM→TP (*p*-542)	-0.040	0,004	9.656	0.000	accepted
H10	EF→TP →WM (*p*-543)	0.016	0.002	7.388	0.000	accepted

According to Table 15, all the analysis results were significant at *p*-values of < .05. This provides an answer to the third study question: whether the locus of control indirectly affects teachers' performance through work motivation and whether leadership style indirectly affects teachers' performance through work motivation. It was also found that environmental factor directly affected teachers' performance through work motivation. Although, leadership style did not have a direct effect on teachers' performance, it indirectly affected their performance through work motivation. This highlights the significant influence of work motivation on teachers' performance. According to Saad (2018), work motivation could change an employee's psychological situation, resulting in favorable results for the institution.

5. Discussions

Teachers are crucial in improving the quality of education because they play significant roles and responsibilities. Their primary role is to make lesson plans, implement learning, evaluate learning outcomes, analyze evaluation results, provide remedial teaching, and enrichment. The smooth execution of these tasks is facilitated by several factors, namely

the principal's leadership, work environment, motivation, and locus of control. Mulyana et al. (2021) found that work motivation and environmental factors positively impact teachers' performance. Furthermore, Sarwar et al. (2022) observed that principal leadership impacts teachers' performance in Faisalabad colleges. Drawing on previous relevant studies and a comprehensive analysis of variables affecting teachers' performance, the following explanation are provided:

After testing the first hypothesis, it was found that locus of control had a significant direct effect on work motivation with a magnitude of *p*-41 = 0.428 x 0.428 =.1832 or 18.32. These results are consistent with previous studies that used structural equations model to produce a 12.46% direct effect of an internal locus of control on intrinsic motivation (Sundjoto, 2017). In support of the second hypothesis, it was discovered that locus of control had a significant direct effect on teachers' performance at *p*-51 = .856 x .856 = .7327 or 73.37%. These results are consistent with prior studies that suggest a positive influence of locus of control on employee performance (Vishal, 2013), with an estimation of 21.62% (Siregar & Nahumury, 2015).

The third hypothesis testing showed leadership style had a significant direct effect on work motivation with a magnitude of *p*-42 = 0.348 x 0.348 = 0.1211 or 12.11%. This result is consistent with previous studies that leadership style positively influenced employee work motivation by 14.29% (Yalçınkaya et al., 2021). According to Rawung (2013), leadership style significantly affects work motivation in the education administration of employees at Manado State University, Indonesia. However, the fourth hypothesis demonstrated that leadership had no significant direct effect on teachers' performance, as the *p*-value was greater than 0.50. This result contradicts previous studies suggesting that leadership style affects SME firm performance in Turkey by 18.06% (Özer & Tınaztepe, 2014). The studies conducted in Perhutani, Indonesia, showed that leadership style positively influenced employee performance by 8.41% (Syafii et al., 2015; Al Khajeh, 2018), and also claimed three leadership styles influence organizational performance, namely democratic, transformational, and autocratic.

The differences in the magnitude of influence between this study and the previous ones are due to the sample size and nature of the respondents in each community, which can have different work cultures. The differences in sample size can affect the magnitude of influence and may interfere with the formulation of study conclusions (Faber & Fonseca, 2014). Respondents with similar cultural backgrounds may have distinctive response patterns and differ in their work styles from those with other national cultures (Mustajbašić & Husaković, 2016).

The fifth hypothesis demonstrated an insignificant direct effect of environmental factors on work motivation, with an effect magnitude of *p*-43= .141 x .141 = .02 or 2 %. This is in line with a study suggesting that environmental differences increase teachers' motivation to work better (Alsadoon et al., 2022). On the other hand, the sixth hypothesis demonstrated a significant direct effect of environmental factors on teachers' performance with a magnitude of *p*-53 = .253 x .253 =.064 or 6.40 %. Previous studies have also suggested a positive influence of environmental factors on the performance of kindergarten teachers (Rahardjo, 2014; Wahyudi et al., 2022).

The seventh hypothesis demonstrated a significant direct effect of work motivation on teachers' performance, with a magnitude of *p*-54=.114 x .114 = .013 or .1.30 %. This result is consistent with other studies that work motivation affects performance in Thailand's cooperative board of directors by 2.07% (Chareonwongsak, 2017). According to Ghaffari et al. (2017), there is a positive correlation between motivational factors and job performance.

The analysis result with the most significant influence among *p*-51, *p*-52, *p*-53, and *p*-54 was *p*-51 (the influence of locus of control on the teachers' performance), which had a value of *T*-statistics = 54.708. Therefore, this variable has the most significant influence on teachers' performance. An organization requires employees with a high locus of control due to their ability to overcome uncertainty (Vishal, 2013). This result indicates that the locus of control is essential in running an organization to achieve good organizational performance (Padmanabhan, 2021).

Furthermore, an examination of hypotheses H.8, H.9, and H.10, and work motivation as an intervening variable revealed the following: The eighth hypothesis results showed a significant indirect effect of locus of control through work motivation on teachers' performance, with influence magnitude of *p*-541= .428 x.114 = .049 and *p*-51= 0.856 x 0.856 =.7327. Therefore, the magnitude of the *p*-541> *p*-51 indicates that motivation as an intervening variable does not significantly influence teachers' performance. The influence magnitude of *p*-542 is .348 x .114 = .0397. In contrast, the influence magnitude of *p*-52 is only .0006, hence *p*-542 > *p*-52. It can be concluded that work motivation has significant influence on teachers' performance. However, the magnitude of the influence *p*-543 is only .016, while *p*-53 = .064. Moreover, the magnitude of the influence of *p*-543 < *p*-53, with the conclusion that work motivation did not have a significant effect on teachers' performance. This indicates that motivation as an intervening variable of leadership style effectively influences teachers' performance. According to Widyaningsih and Arfiansyah (2020), there is a jointly significant influence of leadership style and work motivation on performance.

6. Conclusion

This study has proven nine hypotheses out of ten, indicating that the locus of control, leadership style, and environment factor significantly influenced work motivation. Furthermore, locus of control, environmental factors, and work motivation significantly impacted teachers' performance. The Path-analysis showed teachers' locus of control had the most significant influence on performance, as it motivates them to achieve better performance. On the other hand, the principal's leadership style in managing an organization indirectly affected teachers' performance through work motivation, rather than having a direct influence.

Based on the analysis results, it can be concluded that the principal's leadership style did not directly influence teachers' performance. Therefore, the government are expected to have a competency improvement program for the principal to improve their leadership style. This program is vital for the organization because effective leadership plays a crucial role in addressing differences in the character of teachers from different cultures. A leadership style that is acceptable to all organizational members will create solid teamwork. Similarly, improving the environmental factors will boost teachers' motivation and productivity in teaching and learning activities, ultimately influencing their work performance.

6.1. Managerial implications

The Indonesian government has made efforts to improve teachers' professionalism by requiring at least a bachelor's degree. The teachers are also certified for their performance. Moreover, there is an annual study upgrading program conducted by the local government through the education office. Based on the results, the Indonesian

government are expected to increase its efforts in recruiting qualified teachers with the best academic achievement index, personality, commitment, and dedication. Ekwoaba et al. (2015) claimed that specific references to employee recruitment improve organizational performance. Saviour et al. (2016) stated that the recruitment and selection of new employees are crucial to achieving employee performance.

Continuous coaching for the teaching profession is necessary in providing consistent guidance on the four key variables affecting teachers' performance, namely locus of control, leadership style, environment factors, and work motivation. The next development program needs to improve both physical and non-physical environmental factors. The physical environment requires quality improvement, as it is directly related to the smooth work of the teachers. Similarly, non-physical environment factors need to be improved, as they indirectly affect the quality of teachers' work. A comfortable work environment can increase employees' motivation (Taty & Basir, 2016; Ingsiyah et al., 2019).

6.2. Limitations

This study has some limitations, which include the limited number of samples analyzed from the department of education alone, the scope does not represent regional areas in Indonesia, and the analysis of variables only involved school organizations. Therefore, the results cannot be generalized, but can be presented to schools to improve the quality of education in Indonesia.

Author Statement

The authors declare that there is no conflict of interest.

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ORCID

Virgana Virgana https://orcid.org/0000-0003-1329-3319

Merry Lapasau https://orcid.org/0000-0001-6957-9274

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Appendix I

Study instruments

No	Code	New Code	Statement	Variable and Indicator
				Locus of Control (LC)
1	V111	LC11	The teachers should have high confidence.	Confident and collaborate
2	V112	LC12	The teachers should be firm in the enforcement of discipline.	
3	V124	LC13	The teachers act against learning disorders.	
4	V131	LC14	The teachers always discuss and determine the learning method with peers.	
5	V132	LC15	The teachers always cooperate in the preparation of the learning plan.	
6	V142	LC16	The teachers give students homework for material understanding.	
7	V114	LC21	The teachers should dress neatly and always fresh.	Own initiative
8	V122	LC22	Teachers should take action when students have any individual problems.	
9	V123	LC23	The teachers give motivation to the students.	
10	V133	LC24	The teachers always seek for help when faced with complex problems.	
11	V141	LC25	The teachers assist students' learning difficulties.	
12	V143	LC26	The teachers always finish learning on time.	
13	V151	LC27	The teachers always prepare lesson materials before class.	
14	V113	LC31	The teachers should speak clearly.	Hard-working
15	V121	LC32	Teachers should be able to solve the problems faced by their students.	
16	V134	LC33	The teachers will assist when there is a request.	
17	V144	LC34	The teachers always come on time to teach.	
18	V152	LC35	The teachers always give feedback on homework.	
19	V153	LC36	The teachers always explain the lesson material systematically.	
20	V154	LC37	The teachers continuously analyze the students' learning outcomes.	
				Leadership style (LS)
21	V211	LS11	The principal is always confident in their opinion.	Communicative
22	V244	LS12	The principal gives awards to outstanding teachers.	
23	V251	LS13	The principal has a way of communicating with the teachers.	
24	V252	LS14	The principal has a way of communicating with the staff.	
25	V253	LS15	The principal has a way of communicating with students.	
26	V254	LS16	The principal has a way of communicating with parents.	
27	V212	LS21	The principal always gives directions to subordinates.	Expertise in directing
28	V222	LS22	All staff respect the principal.	
29	V224	LS23	The parent-teacher organization respects principals	
30	V231	LS24	The principal is an expert in explaining the duties of the teachers.	
31	V232	LS25	Principals are experts in explaining staff duties.	
32	V234	LS26	The Head of the school advises their subordinates.	
33	V242	LS27	The principal clearly explains the results of the meeting decision.	
34	V213	LS31	The principal always acts decisively when making decisions.	Self-confidence respect of subordinates
35	V214	LS32	The principal always acts consistently.	
36	V221	LS33	All teachers respect the principal.	
37	V223	LS34	All students respect the principal.	
38	V233	LS35	The principal can set an example of a good job.	
39	V241	LS36	The principal gives the decision of the meeting in a democratic manner.	
40	V243	LS37	The principal assigns duties to the teachers according to their	

			competence.	
				Environment factor (EF)
41	V311	EF11	Air circulation at school is excellent.	
42	V312	EF12	The lighting of the place of the podium is excellent.	Completeness of information technology equipment
43	V332	EF13	Teachers' communication with students are very smooth.	
44	V342	EF14	There is smooth communication between the teachers and peer.	
45	V352	EF15	The school provides a free internet network.	
46	V353	EF16	The school provides a television network for learning.	
47	V354	EF17	The school provides online learning.	
48	V313	EF21	The school situation is perfect for online learning.	
49	V321	EF22	The school provides computer/laptop for learning.	
50	V324	EF23	The school provides media attendance for the students.	
51	V331	EF24	The relationship between the teachers is perfect.	Comfort work atmosphere
52	V341	EF25	There is smooth communication between the principal and teachers.	
53	V343	EF26	There is smooth communication between the teachers and staff.	
54	V344	EF27	There is smooth communication between the principal and staff.	
55	V314	EF31	The rooms are equipped with air condition.	Completeness of work equipment
56	V322	EF32	The internet network at school is outstanding.	
57	V323	EF33	Teachers subscribe to online media for learning.	
58	V333	EF34	There is a tranquil atmosphere at school for online learning.	
59	V334	EF35	The school's relationship with the industry community is perfect.	
60	V351	EF36	The school provides telephones for free.	
				Work Motivation (WM)
61	V411	WM11	The teachers always prepare work equipment.	
62	V422	WM12	The teachers receive rewards for their performance.	Desire to achieve working standards
63	V434	WM13	The teachers complete their task.	
64	V443	WM14	The teachers evaluate student learning outcomes.	
65	V444	WM15	The teachers analyze student learning outcomes.	
66	V452	WM16	The teachers always give student assessment results on time.	
67	V414	WM21	The teachers always teach on time.	
68	V441	WM22	The teachers make a learning plan before teaching.	
69	V453	WM23	The teachers always complete the assignment from the boss on time.	Desire to complete the task immediately
70	V454	WM24	The teachers complete their jobs before the arrival of new ones.	
71	V412	WM31	The teachers continuously check the work schedule.	
72	V413	WM32	The teachers always pray before work.	Eagerness to work
73	V421	WM33	The teachers believe they will be rewarded after working well.	
74	V451	WM34	The teachers never delay work.	
75	V423	WM41	The teachers believe that their work achievements will be rewarded.	Love to work with personal responsibility
76	V424	WM42	The teachers work because they will be rewarded.	
77	V431	WM43	The teachers are responsible for student achievement.	
78	V432	WM44	The teachers are responsible for the materials given to the students.	
79	V433	WM45	The teachers are responsible for all lesson materials given to the students.	
80	V442	WM46	The teachers teach according to plan.	
				Teachers' performance (TP)
81	V511	TP11	The teachers master the materials, structures, concepts, and scientific mind-sets that support the subjects.	
82	V512	TP12	The teachers master the standard of comprehension and basic study.	Professional competencies
83	V521	TP13	The teachers master the theory of learning and the principles of educational learning.	
84	V523	TP14	The teachers participate in educational development activities.	
85	V543	TP15	The teachers adapt effectively.	

86	V554	TP16	The teachers use zoom or other application for online teaching.	
87	V513	TP21	The teachers creatively mastered the subject matter.	Social Competence
88	V522	TP22	The teachers are able to develop the curriculum.	
89	V524	TP23	The teachers take reflective actions to improve the quality of learning.	
90	V531	TP24	The teachers act according to Indonesian national religious, legal, social, and cultural norms.	
91	V532	TP25	The teachers exemplify honest and noble figure for learners and the community.	
92	V544	TP26	The teachers communicate with their professional community and other professionals orally, in writing, or other forms.	
93	V551	TP27	The teachers use information and communication technology to communicate and develop themselves.	
94	V514	TP31	The teachers develop professionalism on an ongoing basis and take reflective action.	Personal and ICT competencies
95	V533	TP32	The teachers are steady, stable, mature, wise, and authoritative.	
96	V534	TP33	The teachers show a work ethic, high responsibility, pride, and self-confidence in their profession.	
97	V541	TP34	The teachers act objectively, without discriminating.	
98	V542	TP35	The teachers communicate effectively, empathetically, and politely with fellow educators, staff, parents, and the community.	
99	V552	TP36	The teachers are proficient in using the internet as a learning resource.	
100	V553	TP37	The teachers can create learning media by themselves.	