Aspects Affecting Learning Management Policy Acceptance for Teachers in Vocational Higher Schools: A Structural Equation Modelling Approach

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Abstract: The background of this research relates to the performance of teachers in engineering and technology vocational schools. About the main tasks carried out by a teacher, it is certainly not an exaggeration to say that the level of competence of a teacher determines the barometer of the quality of Indonesian vocational education. This study identifies and analyses the factors influencing vocational education, especially in engineering and technology. This study examines the factors that influence the management of learning by vocational schoolteachers in technology and engineering. The evaluation includes five key variables, namely work motivation, work ethic, teacher performance, management innovation, and learning management. The following section examines the methodology used to assess the variables and describes the sampling and data collection approach. The sampling technique used simple random sampling, and the research respondents were 30 teachers in 3 vocational schools in Semarang, Indonesia. A combination of factor analysis and regression analysis was used to analyse the data using second order PLS-SEM analysis. The measurement model entails assessing two key aspects: convergent validity and discriminant validity. The results show that work motivation is 63.9%, and work ethics is 28.2% positively affecting teacher performance. So, all Ha hypotheses are accepted, which shows a positive and significant influence of work motivation and work ethic on teacher performance. The subsequent predictive relevance (Q2) assessment revealed that the research model attained a Q2 score of 0.446, surpassing zero. This outcome underscores the model's high predictive relevance. In aggregate, our exogenous variables collectively account for 69.8% of the variance observed in the context of learning management found in Vocational Higher Schools in the field of technology and engineering, and this portion of variance is indeed considerable. Schools are expected to encourage work motivation and review the learning process from planning to implementation to improve teacher performance readiness.

Keywords: *learning management system, management innovation, teacher performance, work ethic, work motivation*

1 Introduction

The current era of modernization and globalization demands a response to the growing competitiveness of various competitions (Taranov & Taranov, 2021). It is essential to equip each field with top-notch human resources. Among the crucial sectors requiring the utmost focus and priority is formal education provided by schools (Morris & Rohs, 2023). These institutions play a vital role in cultivating high-calibre human resources and achieving educational objectives for the betterment of the nation's well-being (Drigas, Mitsea, & Skianis, 2023; Gimbert, Miller, Herman, Breedlove, & Molina, 2023; Zebua & Chakim, 2023).

The role of the teaching profession is pivotal within the education process, serving as a crucial endeavour to nurture the nation's development and cultivate exceptional human resources (Zimmerman, Greenberg, & Weinstein, 2023). Effective communication and interaction between teachers and students undoubtedly yield high-calibre educational outcomes. This success not only contributes to eliminating ignorance and underdevelopment but also serves as a yardstick for measuring the nation's advancement (Darling-Hammond, 2021).

This significant responsibility necessitates a teacher to exhibit professionalism. Furthermore, teachers must possess the adaptability to confront the diverse array of challenges that will arise in the future due to the impact of advancements in science and information technology (Alam, 2022). Teachers who comprehend their roles and responsibilities as teachers and mentors remain driven to continually evolve and progress as experts in their field (Kusumaningrum et al., 2018). Nevertheless, the capacity to independently advance into professionals isn't universal among all teachers. As a result, teachers require assistance and guidance, which underscores the necessity for initiatives aimed at enhancing teacher professionalism (Philipsen et al., 2019).

Hence, there arises a necessity for a dedicated governmental or related institutional effort to foster and advance the teaching profession, coupled with the individual teacher's commitment to attaining professional excellence (Lasmanawati et al., 2021). It is needed to enhance the capabilities deemed superior in teachers, encompassing creative thinking, productivity, sound decision-making, problem-solving, adaptability in learning, collaboration, and self-management (Cidral et al., 2018). In addition, teachers must possess the ability to facilitate independent learning among their students through the execution of effective learning processes. This implies that each teacher should be equipped with proficient learning management skills.

Online learning technologies, one product of management innovation to improve the quality of the learning aspect, designed for generating, overseeing, and dispensing course materials are termed Learning Management Systems (LMSs) (Sabharwal et al., 2018; Turnbull et al., 2020). Within the prevalent digital landscape of today, LMSs assume a crucial function in enriching and streamlining the teaching and learning process (Turnbull et al., 2021). These systems not only facilitate the distribution of instructions and digital resources to enhance collaborative student learning but also empower teachers to concentrate on crafting purposeful pedagogical engagements (Zimmerman et al., 2023).

Studies focusing on the utilization of the LMS have been massively adopted. Raza and colleagues conducted a study to examine how

social isolation impacts students' behavioural intention toward the use of a learning management system, considering the moderating influence of fear related to the Coronavirus (Raza et al., 2021). Aldiab and collaborators conducted a comprehensive review of various features present in commercially accessible and extensively utilized modern LMS systems, accompanied by a comparative assessment (Aldiab et al., 2019). Juhanak et al delved into the exploration of students' interactions and behaviours in diverse forms of online quiz-based activities conducted within an LMS (Juhaňák et al., 2019).

Functioning as a pivotal instrument that facilitates the implementation of learning management strategies, the LMS stands out as an innovative notably advantageous resource for teachers. It serves as a robust means through which teachers can seamlessly guide the learning process and cultivate interactive engagement with their students. However, amidst these benefits, it is crucial to underscore that successful attainment outcomes rely on the commitment of teachers as an internal factor in observing fundamental requisites. This commitment is paramount in ensuring that the utilization of learning management tools is executed in a manner that harmonizes with the projected objectives and expected results.

In general, the challenges faced by vocational higher education: 1. Link and Match with industry has not occurred as a whole: a. Industry involvement in vocational implementation is still very limited. Accreditation of vocational institutions does not involve industry; b. Unemployment of Vocational graduates is 16.41% of total unemployment; c. Industrial interest in collaboration with vocations is limited. Tax incentives (PP. 45/2019) need to be supplemented with meaningful engagement incentives. 2. Facilities and Infrastructure a. Practice support facilities are not optimal; b. There is a need for additional industrial practice places for students in several areas. 3. There are not enough lecturers in vocational institutions: Many Polytechnic lecturers have academic backgrounds (70%) 4. The demographic bonus is characterized by the number of people of productive age being greater than the number of people of non-productive age. These conditions need to be utilized optimally to improve the quality of human resources, competitiveness and people's welfare. 5. Industrial revolution 4.0 which resulted in changes in the economy, jobs and even society. Trends in automation and data exchange in manufacturing technologies, including cyber-physical systems, Internet of Things (IoT), cloud computing and cognitive computing. The government needs to respond to this through courses and training programs that can touch every corner of people's lives.

The contribution of this research is to strengthen the revitalization of vocational education. All educational institutions are required to have cooperation and partnerships with the industrial world, initially by building industry trust in vocational education; 2. Improving the quality and quality of human resources in vocational education, including lecturers/instructors based on industry needs; 3. Develop curriculum, facilities and infrastructure, learning patterns based on industry needs; 4. Developing content for competency tests as well as apprenticeships and placement of graduates in collaboration with industry; 5. Changing people's mindset that vocational education is more interesting because it is applicable, one of which is by implementing polytechnics as applied universities.

Conceptual Development

Work Motivation

Organizational leaders always hope that their employees can carry out the tasks given efficiently and by expectations. When these tasks do not go smoothly, it is necessary to understand why. Is this problem caused by limited individual abilities in completing tasks or a lack of support

or encouragement from superiors to their subordinates? Etymologically, "motivation" comes from the word "motive." Gerungan (2012: 140) explains that "motive" is a concept that includes all factors, reasons, or impulses in humans that encourage them to act. Kartono (2010: 135) defines work motivation as "not only related to financial needs, but also involves rewards from the environment, personal achievement, and social status which are abstract social rewards." Mangkunegara (2013:94) describes work motivation as "a condition that influences, directs, and maintains behaviour related to the work environment." In other words, work motivation is a factor that motivates individuals to perform specific actions in the context of work. In this context, it is essential to remember that a lack of work motivation can result in individuals only giving minimal effort at work. Work motivation is a crucial element in understanding individual performance in organizations because work motivation includes providing encouragement, creating motives, or influences that trigger specific actions. According to Sri (2009), the term "motivation" has various meanings, such as desire, hope, goals, objectives, needs, encouragement, motivation, and incentives. The origin of the word "motivation" comes from the Latin "movere," which means "to move." In a comprehensive definition, motivation is a process involving physical and psychological deficiencies that encourage individuals to perform behaviours or drives aimed at achieving goals or incentives. According to ARUM (2022), several indicators of work motivation can be recognized: Physiological Needs include basic needs such as food, drink, shelter and other aspects that support one's physical survival. Safety Need: Individuals need to feel safe in their work environment. This includes aspects of physical security as well as job stability. Socialization Need: Good social relations and the quality of interaction with colleagues and superiors are also essential factors in work motivation. Need for Reward: Rewards in recognition, financial rewards, or other rewards can increase individual work motivation. Self-Actualization Need: Developing personal potential, achieving personal goals, and being successful in a career is also an important motivating factor. By understanding and meeting these needs, organizations can create a more motivating and productive work environment for employees.

Work Ethic

Work ethic has a vital role in improving teacher performance. A positive work ethic is the key to carrying out tasks effectively and producing satisfying results. McShane and Von Glinow (2008) say that ethics is related to moral principles or values determining whether an action is right or wrong. Lawton (2013) defines ethics as principles that provide a framework for making morally based decisions and guide individuals in their actions. In other words, ethics provides guidelines for directing one's behaviour according to a set of moral principles. Individuals with a high or positive work ethic, as described by Porter (2004), usually exhibit the following characteristics: punctuality, pride in their work, ability to work independently, responsibility, willingness to take initiative, and ability to complete tasks. Task carefully. Meanwhile, according to Miller, Woehr, and Hudspeth (in Meriac, Poling, and Woehr, 2009), individuals with a strong work ethic will show traits such as a focus on work, self-confidence, hard work, efficient time management, integrity, morale, the ability to delay self-gratification and avoid wasting time. Previous research, such as by Wahyudi et al. (2013), has shown that work ethic significantly affects performance. This underscores the importance of establishing and encouraging a positive work ethic among teachers, as this can improve their performance and, overall, increase the effectiveness of education in the school setting.

Teacher Performances

Performance, or in English known as "performance," is the leading indicator of success for an organization and the individuals who work in it. Performance is one of the essential keys that must run effectively so that the organization as a whole can achieve its goals. Performance is a result that can be measured by achieving specific goals. Good performance results are usually a consequence of good behaviour. This includes prudent and effective conduct appropriate to the required skills and competencies. Pratami, Harapan, and Arafat (2018) have emphasized the importance of the link between good behaviour and good performance results. Walang and Ahmad (2019) describe that performance systems usually cover two main aspects, namely behaviour (what employees do) and results (results of that behaviour). However, it is essential to remember that the performance dimension includes the results of the behaviour and the behaviour itself. In other words, how a person acts, works, and behaves in a work context is very important in determining the final performance results. Therefore, promoting appropriate and effective behaviour is essential to achieve optimal organisational performance. Performance is a critical element that must function effectively to achieve overall organizational success. In Armstrong's view, performance results from achieving various goals and the processes that enable the achievement of these goals. It covers various performance dimensions, including performance related to work processes and outcomes. Armstrong (2006) states that performance involves behaviour and results. Performance reflects the behaviour of individuals involved in work and changes the concept of performance from something abstract to real action. Apart from being an instrument for measuring results, behaviour in performance is also an actual result, which is the product of mental and physical effort applied to tasks and can be assessed separately from the final result. Colquitt views performance as a set of behavioural values generated by employees, both positive and negative, that contribute to the achievement of organizational goals. Colquitt's view emphasizes that performance includes behaviour within the employee's control but only in the context of behaviour relevant to job achievement. In this definition, the performance focuses on employee behaviour in the context of the core job duties and responsibilities. Overall, performance results from the interaction between employee behaviour and organizational goals. This includes how individuals work, whether in terms of the tasks performed or the behaviours that affect the productivity and effectiveness of the organization. The definition of performance, according to Colquitt, indeed focuses on performance behavior related to the core duties and responsibilities of the job. This includes behaviour that can be positive or negative, and all impact achieving organizational goals. The definition of performance proposed by Colquit emphasizes that performance primarily includes behaviour relevant to work performance that is within the employee's control. In other words, in Colquitt's view, performance is how healthy individuals carry out their core job duties and responsibilities and how their behaviour contributes to achieving organizational goals. This definition allows organizations to assess and measure the extent to which employees fulfil their duties and the extent to which their behaviour supports organizational success. Teacher performance results from the teacher's work in carrying out their duties based on abilities, skills, and experience and in accordance with predetermined competencies and work criteria.

Classroom observation is often used as a general way to assess teacher performance (Moradi, Sepehrifar, & Khadiv, 2014). In the evaluation process, students are often the primary assessors of teacher performance (Ardiana, 2017). Some indicators used to measure teacher performance include: Ability to Develop Lesson Plans (RPP):

This includes the extent to which teachers can plan and organize learning materials according to the curriculum and student needs. Ability to Implement Learning: The teacher can convey subject matter, facilitate discussion, and implement appropriate learning strategies. Skills in Interpersonal Relations: Teachers must interact well with students, colleagues, and parents. This ability includes effective communication and the ability to build positive relationships. Ability to Assess Learning Outcomes: Teachers must objectively assess students' understanding and progress. This includes skills in designing tests and evaluation assignments. Ability to Implement Enrichment Programs: Teachers must also identify the needs of more capable students and implement enrichment programs for them. These indicators are an integral part of teacher performance assessment, and the results are used to understand the extent to which teachers are successful in teaching and supporting student growth and development.

Management Innovation

Management innovation's essence lies not in creating innovative solutions per se but in establishing an environment that nurtures creativity—a space wherein solutions can be envisioned, nurtured, and implemented. As pointed out by Goyal and Pitt in 2007, the emphasis is not solely on generating novel answers but on cultivating an atmosphere that encourages the birth and evolution of solutions from inception to execution. This perspective highlights the significance of fostering an organizational culture that supports and empowers the entire innovation lifecycle, from idea generation to practical implementation. According to Scarbrough and Swan (2001), the emergence and expansion of knowledge management constitute a managerial reaction to the tangible patterns linked with globalization and the era following industrialization. These patterns encompass the proliferation of knowledge-based job roles and the technological progress of information and communication technology (ICT).

The strategic implementation of learning technology has a dual impact, influencing the organizational milieu and production technology. This, in turn, shapes the creative procedures and the accumulation of organizational knowledge, thus impacting the competitive edge of the entity (Ahmad and Schroeder, 2011). A pivotal driver fuelling the swift evolution of organizations, including educational establishments, is the effective implementation of collaborative teamwork methodologies (Anderson and West, 1998). In contemporary settings, the strategic integration of learning technology holds the power to transform the very fabric of an organization. It has a twofold effect – not only does it reshape the immediate organizational context, but it also exerts influence on the technology employed for production. This interplay extends its reach to impact the intricate creative processes that underlie the generation of novel ideas and the accumulation of essential organizational knowledge. Ultimately, this synthesis of technology and strategy becomes a determinative factor in shaping the organization's competitiveness within the broader landscape.

Within educational institutions and businesses alike, the impetus for rapid advancement is inherently tied to the efficient orchestration of collaborative efforts. In a landmark study, Anderson and West (1998) underscored the pivotal role of cohesive teamwork in propelling organizations forward. This bears testimony that the real catalyst for growth is not merely the application of advanced technologies or sophisticated strategies in isolation but rather the harmonious convergence of both elements to foster an environment conducive to innovation and development.

Learning Management

The use of technology in learning, primarily through the Learning Management System (LMS) and E-learning, is essential in this digital era.

LMS is a system that facilitates online learning management, while E-learning is a learning approach that utilizes computer technology and other devices. This includes using information technology to create learning experiences in virtual environments. In this context, E-learning can be defined as using internet and web technologies to support the learning process. The main principle of E-learning is its ability to be connected to a network, making it easier to update, store, distribute, and share instructions and information instantly. This makes learning flexibly accessible to students, regardless of location and time. The use of LMS and E-learning has brought significant changes in the way education and learning are carried out. They provide students and students with broader access to educational resources, interact with learning materials, and communicate with instructors and fellow students online. It also provides moments in study time, allowing individuals to study according to their schedule.

This study assesses factors influencing learning management by teachers in Vocational Higher Schools in the field of technology and engineering. The evaluation encompasses five key variables: work motivation, work ethic, teacher performances, management innovation, and learning management. The subsequent section elucidates the methodology employed for assessing the variables and outlines the sampling and data collection approaches utilized. Following that, this study delves into the techniques used for data analysis and the resulting findings. In last, the conclusion by highlighting the implications derived from the findings and proposes future research directions.

2 Material and Method

This section outlines the approach undertaken to execute the present study. The chosen methodology involved the utilization of a survey research design, aimed at comprehensively exploring the research objectives. The segment provides a comprehensive breakdown of the questionnaire design and the data collection process conducted. Furthermore, it delves into the finer details of how the constructs under scrutiny were meticulously measured to ensure a robust evaluation of the research variables.

Questionnaire Design

A set of questionnaires was meticulously devised to serve as a robust tool for gauging both the understanding of conceptual definitions and their practical application. Survey data collection was carried out through questionares. Respondents filled out questionnares with 10 statement items for work motivation (Andrianto, Komardi, & Priyono, 2023; Febriani, Ahyani, & Fitriani, 2023; Nugroho, Tannady, Fuadi, Aina, & Anggreni, 2023), 10 statement items work ethic (Kamaruddin, Tannady, Al Haddar, Sembiring, & Qurtubi, 2023; Risadiana, Agung, & Yudana, 2023), 10 statement items for teacher performances (Kamaruddin et al., 2023), 10 statement items for management innovation (Karatepe, Dahleez, Jaffal, & Aboramadan, 2023), 10 statement items for learning management (Riza, Piantari, Junaeti, & Permana, 2023).

These questionnaires incorporated a 5-point measurement scale, encompassing a range from "Strongly Disagree" (1) to "Strongly Agree" (5), following the methodology outlined by Likert in 1972. The variables were measured using a scale of 1 to 5, which explains whether the respondent agrees or not with certain statements. Score 1, the respondent strongly disagrees with a certain statement; score 2, the respondent does not agree with a certain statement; score 3, the respondent is neutral with certain statements; score 4, the respondent agrees with a certain statement; and a score of 5, the respondent strongly agrees with a certain statement. A five-point Likert scale was used because this questionnaire was able to accommodate respondents' answers that were neutral or unsure.

Reability and Validity

To ensure the calibre and relevance of the content, various tools inherent to the research process were judiciously utilized. The assurance of both content validity and reliability rested on the evaluation of five experts, each a specialist in their respective fields. This panel of experts meticulously reviewed the content to ascertain its alignment with the research's objectives and scope. Reliability refers to the consistency or stability of a measurement over time or between different raters. A measurement instrument is considered reliable if it consistently provides the same results when used repeatedly to measure the same thing. In other words, a reliable instrument is an instrument that provides consistent results, regardless of who gives it, when it is given, and under what conditions it is given. Validity refers to the extent to which a measurement instrument measures what it is supposed to measure. A measurement instrument is considered valid if it accurately measures the concept or construct it wants to measure. In other words, a valid instrument is one that measures what it claims to measure and produces results that are meaningful and relevant to the research question. Reliability refers to the consistency of measurement, while validity refers to the accuracy or correctness of the measurement. Although reliability is important to ensure the consistency and stability of results, validity is essential to ensure that the results obtained from a measurement instrument are meaningful and relevant to the research question.

The Data Collection Procedure

Research data collection was carried out through questionnaires which were distributed via Google Form to respondents. The respondents were teachers at vocational schools that had building engineering education programs. The purpose of this study centred on discerning the factors influencing learning management by teachers in Vocational Higher Schools for the technology and engineering field. To ascertain an appropriate sample size for this study, the G*power analysis method, a well-regarded approach in the structural equation modelling realm, was applied (Kaya, Düzgün, & Boz, 2023). Since the model featured two predictors, this study aimed for a medium effect size and a power level of 0.8. As a result, a minimum sample of 32 was deemed necessary. However, the sample size was increased to 385 due to the diversity inherent in the population, as suggested by (Hair et al., 2019). By expanding the sample size, this study aimed to better accommodate the heterogeneous nature of teachers as participants. This larger sample would consequently enhance the statistical robustness of the findings. Specifically, with a sample size of 385, it would achieve a power exceeding 0.9. This strategic decision ensures that this study is equipped with ample statistical strength and confidently generates substantial and reliable insights from the data analysis carried out.

Construct Measurement

This study has constructs comprising two independent variables, work motivation and work ethic. Teacher performances variable will have double functions as dependent variables for testing H1 and H2. Then, it will serially mediate together with management innovation to prove H5 and H6 with learning management as a dependent variable. In addition, learning management has the same role to check H3 and H4. Figure 1 shows the hypothesis paths of this study.

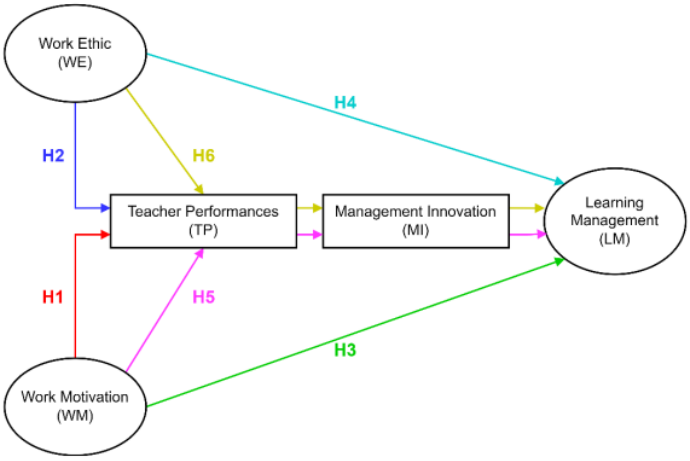

Figure 1. The hypothesis paths of the factors influencing learning management.

All the indicators used in the analysis were of a reflective nature. Additionally, it's noteworthy that every single item incorporated in the analysis was drawn and adapted from established and previously conducted research studies.

- Work motivation were adapted from the work of the study of (Andrianto, Komardi, & Priyono, 2023; Febriani, Ahyani, & Fitriani, 2023; Nugroho, Tannady, Fuadi, Aina, & Anggreni, 2023)
- Work ethic were adapted from the work of the study of (Kamaruddin, Tannady, Al Haddar, Sembiring, & Qurtubi, 2023; Risadiana, Agung, & Yudana, 2023)
- Teacher performances were adapted from the work of the study of (Kamaruddin et al., 2023)
- Management innovation were adapted from the work of the study of (Karatepe, Dahleez, Jaffal, & Aboramadan, 2023)
- Learning management were adapted from the work of the study of (Riza, Piantari, Junaeti, & Purmana, 2023)

The type of research used was quantitative research with sampling using random sampling techniques and a sample of 30 teachers from 3 vocational education institutions in Semarang was obtained. The list of schools and the number of respondents are Vocational Higher School (SMK) 7 Semarang, (10), SMK 4 Semarang (10) and SMK 1 Semarang (10). In order to ensure that the items were devoid of ambiguity and accurately captured the intended constructs, a preliminary pilot study involving 30 participants was carried out prior to the primary data collection phase. This step was taken to refine the measurement instruments and to align them more precisely with the research objectives. Also, the expertise of specialists in the field was enlisted to validate the items for their relevance and suitability. Drawing from the insights gained from both the pilot study findings and the input provided by these experts, certain items underwent revisions to improve their clarity and overall effectiveness in capturing the intended nuances of the constructs under investigation.

3 Result and Discussion

Partial Least Squares (PLS) which allows latent variable modeling in SEM analysis. Using PLS provides higher flexibility compared to other SEM methods. One of the advantages of PLS is its ability to moderate. Moderation is an important concept in this research because it refers to the influence of an independent variable on the relationship between the explanatory variable (independent) and the dependent variable (dependent). PLS can explore moderation

relationships more effectively. PLS also has advantages in processing data that does not have a normal distribution. This allows data analysis that is more accurate and relevant to real conditions in research. PLS analyzes data realistically and is closer to the actual situation.

To conduct an analysis of the research model, this study employed structural equation modeling (SEM) techniques (Hair Jr & Sarstedt, 2019). Specifically, the analysis was executed utilizing the Partial Least Squares (PLS) method via SmartPLS 3.2.9 software. To scrutinize the pathways within the model, a bootstrap resampling technique was implemented, involving 5000 resampled instances. There are three distinct rationales driving the utilization of PLS in this study. Firstly, the distribution of the samples deviated from the normal distribution, a characteristic that can be effectively accommodated by PLS as previously highlighted (Lubis, Zarlis, & Aulia, 2023). Secondly, PLS is renowned for its ability to handle smaller sample sizes, a particularly advantageous trait as emphasized by (Hair Jr & Sarstedt, 2019). Lastly, the nature of PLS makes it particularly well-suited for exploratory investigations such as the present study, aligning with the insights presented by (Chatterjee, Bhattacharjee, Tsai, & Agrawal, 2021). The research adhered to the recommended two-stage approach suggested by (Hair et al., 2019). This involved a sequential estimation of both the measurement model and the structural model, ensuring a comprehensive examination of the variables and their interrelations. The structural model of this study is shown in Figure 2.

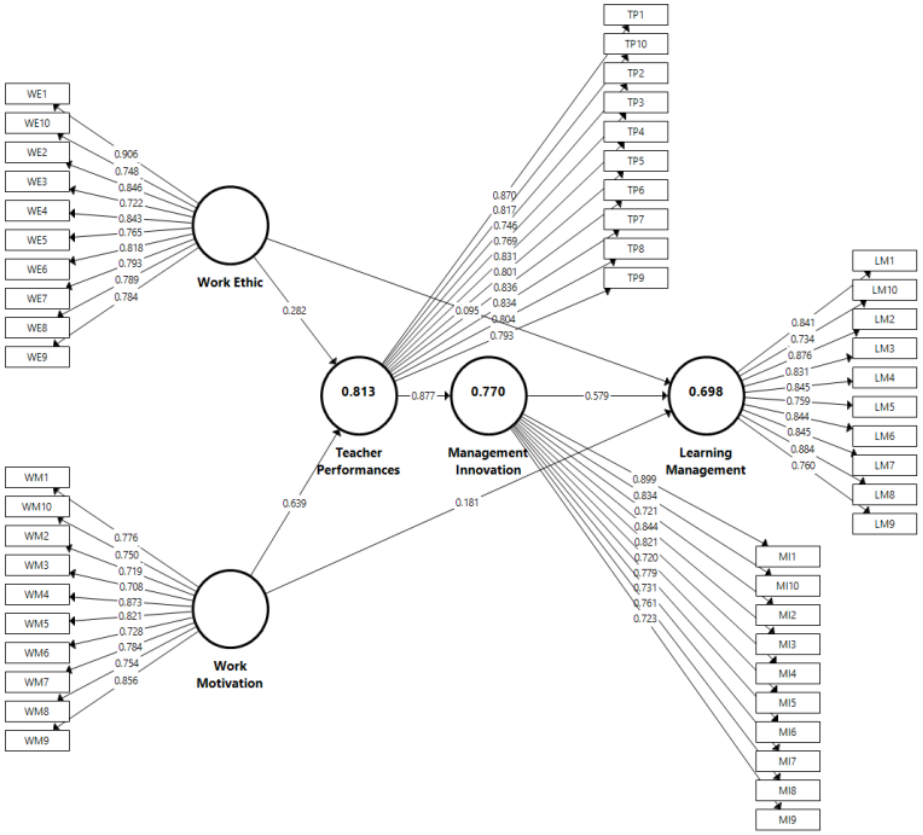

Figure 2. The structural model for the factors influencing learning management.

The Measurement Model

The measurement model entails the assessment of two key aspects: convergent validity and discriminant validity. To ascertain convergent validity, the initial assessment considers indicator loadings and all these loadings are observed to exceed the stipulated threshold of 0.7 as recommended by (Hair et al., 2019). Furthermore, this study examined the Average Variance Extracted (AVE) and observed that all AVE values exceeded 0.5. Convergent validity means that a set of indicators represents one latent variable and is the basis for that latent variable. This representation can be demonstrated through unidimensionality which can be expressed using the average value of the extracted variance (AVE). The AVE value is at least 0.5. This value illustrates adequate convergent validity, which means that one latent variable is able to explain more than half of the variance of its indicators on average. Additionally, the Contruct Reliability (CR) values were scrutinized, ensuring that each of them surpassed 0.7, in line with the criteria presented by (Supriyanto et al., 2022). Moreover, the evaluation of Cronbach's alpha values revealed that all values exceeded the recommended threshold of 0.7 (Zebua & Chakim, 2023)The result of the convergent validity is shown in Table 1. Given these findings, convergent validity was substantiated, and a concurrent assessment of discriminant validity was also carried out (Hair Jr & Sarstedt, 2019). Meanwhile, the data presented in Table 2 establishes that the square roots of each construct's AVE surpassed their respective correlations with other constructs, a principle advocated by (Habibi, Sofyan, & Mukminin, 2023). This thorough evaluation confirms the absence of issues with discriminant validity, allowing for the conclusion that all measures within the model exhibited exceptional psychometric properties.

Table 1. The result of the convergent validity

Construct	Code	Outer Loading	Cronbach α	CR	AVE
Work Motivation	WM1	0.776	0.927	0.939	0.606
	WM2	0.719			
	WM3	0.708			
	WM4	0.873			
	WM5	0.821			
	WM6	0.728			
	WM7	0.784			
	WM8	0.754			
	WM9	0.856			
	WM10	0.750			
Work Ethic	WE1	0.906	0.938	0.948	0.645
	WE2	0.846			
	WE3	0.722			
	WE4	0.843			
	WE5	0.765			
	WE6	0.818			
	WE7	0.793			
	WE8	0.789			
	WE9	0.784			
	WE10	0.748			

Construct	Code	Outer Loading	Cronbach α	CR	AVE
Teacher Performances	TP1	0.807	0.942	0.950	0.657
	TP2	0.746			
	TP3	0.769			
	TP4	0.831			
	TP5	0.801			
	TP6	0.836			
	TP7	0.834			
	TP8	0.804			
	TP9	0.793			
	TP10	0.817			
Management Innovation	MI1	0.899	0.930	0.941	0.617
	MI2	0.721			
	MI3	0.844			
	MI4	0.821			
	MI5	0.720			
	MI6	0.779			
	MI7	0.731			
	MI8	0.761			
	MI9	0.723			
	MI10	0.834			
Learning Management	LM1	0.841	0.947	0.954	0.678
	LM2	0.876			
	LM3	0.831			
	LM4	0.845			
	LM5	0.759			
	LM6	0.844			
	LM7	0.845			
	LM8	0.884			
	LM9	0.760			
	LM10	0.734			

Table 2. Discriminant validity (Fornell and Larcker Criterion)

	Learning Management	Management Innovation	Teacher Performances	Work Ethic	Work Motivation
Learning Management	**0.823**				
Management Innovation	0.829	**0.786**			
Teacher Performances	0.905	0.877	**0.811**		
Work Ethic	0.771	0.886	0.859	**0.803**	
Work Motivation	0.799	0.919	0.894	0.903qa	**0.779**

The Structural Model

In the structural model analysis, the investigation encompassed the evaluation of the path coefficient (β), the t-test value, predictive relevance (Q2), and the coefficient of determination (R2), as advocated by Hair et al. in 2017. To scrutinize the hypotheses and establish their significance, a bootstrapping technique involving 5000 resamples was employed. This technique adhered to a significance level (p) of 5%, adopting a one-tailed test option. First, the testing results showed support for three structural hypotheses and three vice versa listed in Table 4.

Table 4. The summary of the hypothesis test

Hypothesis Path	β	t-test	P-value	Result
H1: Work Motivation → Teacher Performances	0.639	4.446	0.000	S
H2: Work Ethic → Teacher Performances	0.282	1.893	0.029	S
H3: Work Motivation → Learning Management	0.181	0.707	0.240	NS
H4: Work Ethic → Learning Management	0.095	0.367	0.357	S
H5: Work Motivation → Teacher Performances → Management Innovation → Learning Management	0.325	2.043	0.021	NS
H6: Work Ethic → Teacher Performances → Management Innovation → Learning Management	0.143	0.157	0.061	NS

S : Supported, and NS : Not Supported

Table 4 shows the results of the hypotheses testing were as follows:

- **H1:** The work motivation possessed by teachers in Vocational Higher Schools in the field of technology and engineering has a direct and positive influence on teacher performances. Hypothesis testing found that the work motivation of the teachers has a direct and positive influence on teacher performances as witnessed by the coefficient = 0.639, the fact that the hypothesis significance is $p < 0.05$.
- **H2:** The work ethic possessed by teachers in Vocational Higher Schools in the field of technology and engineering has a direct and positive influence on teacher performances. Hypothesis testing found that the ethic motivation of the teachers has a direct and positive influence on teacher performances as witnessed by the coefficient = 0.282, the fact that the hypothesis significance is $p < 0.05$.
- **H3:** The work motivation possessed by teachers in Vocational Higher Schools in the field of technology and engineering has a direct and positive influence on learning management. Hypothesis testing found that the work motivation of the teachers has an indirect and positive influence on learning management as witnessed by the coefficient = 0.181, the fact that the hypothesis significance is $p < 0.05$.
- **H4:** The work ethic possessed by teachers in Vocational Higher Schools in the field of technology and engineering has a direct and positive influence on learning management. Hypothesis testing found that the work ethic of the teachers has an indirect and positive influence on learning management as witnessed by the coefficient = 0.095, the fact that the hypothesis significance is $p < 0.05$.
- **H5:** The work motivation possessed by teachers in Vocational Higher Schools in the field of technology and engineering with serially mediated teacher performance and management innovation acted has a direct and positive influence on learning management. Hypothesis testing found that it has a direct and positive influence on learning

management as witnessed by the coefficient = 0.325, the fact that the hypothesis significance is $p < 0.05$.

- **H6:** The work ethic possessed by teachers in Vocational Higher Schools in the field of technology and engineering with serially mediated teacher performance and management innovation acted has a direct and positive influence on learning management. Hypothesis testing found that it has an indirect and positive influence on learning management as witnessed by the coefficient = 0.143, the fact that the hypothesis significance is $p < 0.05$.

Upon calculating the path coefficients, the subsequent Q2 assessment revealed that the research model attained a Q2 score of 0.446, surpassing zero. This outcome underscores the model's high predictive relevance. In aggregate, our exogenous variables collectively account for 69.8% of the variance observed in the context of learning management found in Vocational Higher Schools in the field of technology and engineering, and this portion of variance is indeed considerable.

Discussion

The Affecting of Work Motivation on Teacher Performances

Motivation is the drive that pushes someone to achieve organizational goals by trying hard when their needs are met. The better a person's performance, the greater the rewards they receive and the higher their job satisfaction. Positive attitudes toward work can create high work motivation in the work environment, while negative attitudes can reduce motivation. Motivated teachers make a better contribution to achieving organizational goals. According to (Andrianto et al., 2023) and (Kamaruddin et al., 2023), improving teachers' work motivation levels can result in increased work motivation, which in turn contributes to improving individual, group, and organizational performance. Findings from research conducted by (Febriani et al., 2023), also show that three aspects of psychological needs can predict work motivation and job performance. In addition, in research conducted by (Chatterjee et al., 2021), there is a significant correlation between work motivation and work performance. Meanwhile, research conducted by Imam and his colleagues in 2015 stated that three variables significantly influenced teacher performance, namely leadership style, corporate culture, and teacher motivation. Results also confirm a positive relationship between work motivation and teacher performance. These views confirm that teacher work motivation has a vital role in shaping the level of work motivation and successful teacher performance in an organizational context.

H1: Work motivation has a positive and significant effect on teacher performance (accepted)

The Affecting of Work Ethic on Teacher Performance

Work ethic is important in providing enthusiasm and stamina for a teacher to carry out his duties. It also influences the teacher's charisma and authority and shapes the teacher's personality and work behaviour. In this context, work ethics refers to viewing work as desirable rather than a burden. Individuals with strong work ethic are highly committed to their work and often feel satisfied in the teacher's work environment (Abbasi and Ghulam, 2012). Work ethics is not just about understanding moral values but also applying them in daily practice, and this can provide significant benefits in a teacher's professional development. The results of the various studies you mentioned, all show that work ethic has a significant positive impact on improving performance (Kaya et al., 2023). These findings underscore the importance of a strong work ethic in influencing performance and contributing positively to various aspects of work.

A good work ethic creates a productive work environment and can improve overall individual and organizational performance results.

H2: Work ethics has a positive and significant effect on teacher performance (accepted)

The Affecting of Work Motivation on Learning Management

Teachers must consider work motivation factors relevant to the school when developing scientific development programs that support school needs. Funding for the provision of e-learning and financing related to other facilities, responsibilities and achievements are the main factors considered necessary by schools when considering work motivation factors that influence teachers' decisions to adopt a course learning management system (LMS) into their teaching practice. The school development program should provide financing to teachers, strengthen teachers' responsibilities for teaching, and help schools achieve their goals and advance their knowledge of teaching using the LMS. Another vital area that motivates teachers' work is the influence of policies both from schools and the state, which in particular, the use of the LMS is mandatory for teachers to use or not. This is what motivated the teacher's decision to adopt the LMS. Because LMS requires bureaucracy and interference from other parties, it does not significantly affect teacher's work motivation. Work motivation also does not have a significant effect on LMS.

H3: Work motivation has not a significant effect on learning management (rejected)

The Affecting of Work Ethics on Learning Management

There are several problems surrounding the implementation of the learning management system, including strengthening work ethics that cannot be carried out continuously and continuously. Strengthening work ethics certainly requires good learning management. Management of continuous supervision work ethics. This phenomenon provides extra duties and responsibilities for teachers to maximize their personal work ethics and the need for proper management of a learning management system.

H4: Work ethics has a positive and significant effect on learning management (accepted)

The Affecting of Work Motivation, Teacher Performances, and Management Innovation on Learning Management

This study has limitations, namely only conducting an analysis using the principal's managerial ability and work motivation variables to determine the effect on teacher performance. Some suggestions that can be followed up by other researchers based on the results of this study are efforts by relevant agencies to increase the competency of school principals in management innovation through holding workshops and training and optimizing supervision of school principal performance. In addition, it is necessary to identify more learning management factors. This is because many factors influence and contribute to teacher performance in their duties and obligations. Other researchers can follow up by conducting further training and research activities by adding or replacing broader variables.

H5: Work Motivation, Teacher Performances, and Management Innovation has not significant affecting on Learning Management (rejected)

The Affecting of Work Ethic, Teacher Performances, and Management Innovation on Learning Management

This study has several limitations, namely the focus on analysing principals' managerial abilities and work ethic variables in relation to teacher performance. For further research, it is suggested that relevant agencies make efforts to improve the competency of school principals in management innovation through organizing workshops and training, as well as maximizing

the supervision of school principals' performance. In addition, it is essential to identify more learning management factors that might influence teacher performance. Because many factors can contribute to teacher performance, future research may consider adding or replacing variables to make them more comprehensive. This underscores the need for more in-depth and broad research to understand the factors influencing teacher performance and how to improve it in the educational context.

H6: Work Ethic, Teacher Performances, and Management Innovation haven't significant affecting on Learning Management (rejected)

4 Conclusion

This study provides information that work motivation and work ethics affect teacher performance in vocational education. Work motivation, from the results of this study is quite good and has a significant effect on teacher performance. This confirms that teachers' work motivation and work ethic level can directly influence their performance. Hypothesis testing found that the work motivation of the teachers has a direct and positive influence on teacher performances as witnessed by the coefficient = 0.639, the fact that the hypothesis significance is $p < 0.05$. Therefore, to improve teacher performance, school supervisor needs to provide high management innovation to teachers. Schools can create a more productive environment and help teachers reach their full potential by providing innovative management that encourages and maintains teacher motivation. This can include developing training programs, organizing workshops, and providing support and constructive feedback to teachers. Innovative management can also help teachers feel valued and encouraged to work better, which will strengthen the quality of education they provide to students. Therefore, it is suggested to the school to design management innovation, provide encouragement and evaluate the learning management system process. The school can review the learning process from planning to the implementation process in the field and whether there are still deficiencies in the learning management system. It is hoped that this review will continue to improve teacher performance. The learning system in innovative management emphasizes on effective, open communication, discussion and public examination of problems encountered in learning, consider each other's views and put forward strategies. System collaborative work where conscious effort has been made to create strategies, policies and structures and institutionalize values, behavior and practices enables individuals and groups to work together effectively to achieve organizational goals.

Conflict of Interest Statement

The authors have no conflicts of interest to disclose. All authors declare that they have no conflicts of interest.

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