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Article

## Teacher's Competences in Technology-Based Education in Indonesia: The Case of a Vocational Accounting Teaching School

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### Abstract

This study examines the increasing competence of accounting teachers at SMK in the capital city of Jakarta through training and teaching experience. Quantitative research design was used to conduct a survey for data collection from a randomly selected sample of 82 accounting teachers. The data was processed using SPSS 25 with a model and partial test, which helped identify and analyze the influencing factors. The results reveal that accounting teacher competence is empirically influenced by work motivation and not by principal leadership. It was also revealed that the competence of accounting teachers in technologically developing education is a coaching process to understand technology integration. Hence, continuous development of accounting teachers can be used to improve teacher learning and in-service training. The study recommends that teacher competence in technology-based education should be more integrated with reliable knowledge and a repertoire of accounting teacher expertise and teaching applications with global competence.

### Keywords

Teacher Competency, Teacher Training, Teaching experience, Vocational Education.

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Based on UNESCO data in the Education Development Index (UNESCO, 2017), Indonesia ranked at 108<sup>th</sup> position in the 2017 Quality of Education ranking statistics. One reason for this low ranking was inadequate teacher competence (Pambudi & Harjanto, 2020). Therefore, Indonesia's Ministry of Education and Culture enacted a development program for teachers by measuring academic competence (teacher competency test), and non-academic (teacher performance assessment) (Mahendra et al., 2020).

Professional teachers are the key to quality education implementation in schools (Akiba & Liang, 2016; Csíkos et al., 2018; Louws et al., 2017). According to the Ministry of Education data, the 2014 Teacher Competency Test has a national average of 53.02 for primary and secondary education levels. Furthermore, there is an average breakdown of 54.77 professional scores with a pedagogic competency score of 48.94. However, this figure is still below the minimum competency standard of 55.0 (The World Bank, 2014).

According to the Vocational school-teacher competency test in Jakarta 2019, each region was found below the score of 55 (<https://npd.kemdikbud.go.id/>). It was clear that accounting teachers did not possess the knowledge and skills required to efficiently teach accounting science to students. Therefore, to overcome this problem and equip teachers with the required expertise, the Jakarta local government conducted a similar vocational teacher competency training for accounting teachers. This condition had become more distinct after the teachers attended the vocational competency training program in accounting (Oesterreich & Teuteberg, 2019; Patrick et al., 2019).

Accounting science is characterized by possessing a developed knowledge while its teaching aims to achieve competency standards in the global accounting and financial fields (Ayuning, 2018). Therefore, students' demands force teachers to always have professional and pedagogical competence in the accounting knowledge field. Moreover, this competence helps students to absorb knowledge and experience in accounting learning (Ayuningtyas et al., 2012; Graham et al., 2020; Kocsis, 2019).

Competence is defined as the ability to do work effectively, attentively, and responsibly (Dikilitaş & Mumford, 2020; Kim et al., 2017; Nousiainen et al., 2018). Furthermore, competence is someone's basic characteristic to causally fulfill the criteria needed to occupy a position. Additionally, this ability and attitude help everyone to carefully and measurably complete the responsibilities assigned to them, which can be obtained only through training (Kim et al., 2017; Sisca et al., 2020).

Skilled and competent people work optimally and prioritize the principles of effectiveness. These abilities are formed on the basis of direct or indirect experience gained (de Laurentiis Brandão, 2021). Additionally, the skills and abilities referred to are identical to the competencies that teachers must possess (pedagogical, personal, professional, and social). Since educational or in-service training affects teacher competence (Janssen et al., 2019), the Indonesia's government formulated four teacher competency standards from the perspective of national education policy (Permendiknas, 2005). These standards relate to pedagogical, social, professional, and personality competencies. This policy of the Indonesian government thus defined teacher's competence as the ability and expertise required to master the knowledge, values, and attitudes while performing their duties and obligations. This mastery would make a great impact on the quality of teaching imparted to students (Cavenett, 2013; Nousiainen et al., 2018).

Education and training is a process of improving employees' theoretical, conceptual, and moral skills (Blimpo & Pugatch, 2019; Ruijgrok-Lupton et al., 2018). Spear and da Costa (2018) define education and training as an effort to develop human resources, especially their intellectual and personality abilities. This affirmation is cited in the Article 2 of the Government Regulation Number 101 of Year 2000, which addressed the issue of Education and Training for Civil Servant Positions. The regulation aimed to increase knowledge, expertise, skills, and attitudes to perform duties professionally based on the personality and ethics of civil servants (Wesman, 2013).

Prasertcharoensuk et al. (2015) asserted that education and practice affected teacher competence as mediation variables. Likewise, other experts believed that education and training directly or indirectly affected the teachers' competence, when provided under the supervision of school principals and supervisors (Taylor et al., 2019; Weyns et al., 2021). This phenomenon entails that work environment does not directly affect competencies; it affects leadership supervision. The variable of work motivation also affects competencies directly and indirectly through leadership supervision. This leads to conclusion that education and training directly or indirectly affect the competencies through work motivation (Weyns et al., 2021).

Teaching experience is the testimony of the work that teachers perform in an authorized educational institution as a task assigned by the institution (Graham et al., 2020). Likewise, Bürgener and Barth (2018) assert that training, development, and work experience directly or indirectly influence a teacher's competence. Ayuning (2018) too mentions that the teachers' motivation significantly affects their competence directly or indirectly. Hence, academic qualifications, teaching experience, and teachers' motivation have a significant influence on teacher's competence. It can therefore be assumed that teaching experience has direct or indirect effect on teachers' competence through work motivation (de Laurentiis Brandão, 2021).

Leadership is the ability to persuade (induce) others to take steps and work to achieve a common goal (Sisca et al., 2020). Furthermore, other experts (Matthews & McLees, 2015; Stephenson, 2017) define leadership as the ability and skill to direct; an ability which is an important ingredient in proving a leader's effectiveness. A few others (Boud et al., 2016; Engin, 2020) believe that leadership is the ability to influence a group towards achieving goals. A teacher's performance is influenced by the headmaster's instructional leadership, who encourages teachers to work optimally and uplift their skills (Navaridas-Nalda et al., 2020). It is also true that principles of leadership develop professionalism in teaching and learning, which helps in improving teacher's skills (Veletić & Olsen, 2021; Zhu et al., 2020). Thus, it can be assumed that leadership directly or indirectly affects teacher competence through work motivation (Liu & Werblow, 2019; Navaridas-Nalda et al., 2020).

Al-Mahdy et al. (2018) affirm that emotional intelligence and principal leadership directly or partially affect a teacher's work motivation and performance. However, it is specified that emotional intelligence and leadership have a direct, significant and greater effect on the teacher's performance than the indirect effects of work motivation. Another study, (Player et al., 2017), suggests that the principal's leadership style is a vital aspect in building a teacher motivation. This suggests that the principal's leadership affects teachers' competence and motivates their work (Hämäläinen et al., 2020).

Additionally, a few other studies, (Bjekić et al., 2014; Osman & Warner, 2020), have found out that work motivation encourages individuals to act with certainty and precision in order to achieve their goals. Work motivation is the driving force and provides the impetus to behave and work properly when attending to duties and obligations (Slemp et al., 2020). This encourages individuals to perform certain activities and acts as a driving force for the will to create excitement and achieve desired goals. Shafi et al. (2020) asserted that work motivation is responsible to trigger a series of human behavior processes in individuals in order to achieve their goals. However, different results are found in other empirical studies where work motivation is used as a mediating variable. For instance, some recent studies have empirically concluded that motivation could make a partial mediating effect on employee performance and job fatigue (Cho & Yang, 2018; Graves & Sarkis, 2018; Vatankhah, 2021). Other experts (Osman & Warner, 2020; Slemp et al., 2020; Vatankhah, 2021) suggest that motivation acts as a mediator between professional certification and teacher performance but does not significantly mediate the influence of principal leadership on teacher performance.

The aforesaid statements, assumptions and citations help in understanding the correlation between all the variables mentioned. Such a correlation therefore would help in understanding the problems stated in this study such as: whether training and teaching experience, and principal leadership influence teacher performance through work motivation; and whether vocational accounting teacher competencies can be indigenously developed in Jakarta, Indonesia.

## Method

### Participants

The study was conducted at a vocational accounting teaching school where 82 accounting teachers were selected using proportional random sampling method (Majid, 2018; Sekaran & Bougie, 2017; Sekaran & Bougie, 2019; Taherdoost, 2017).

### Instruments

The data was collected using a questionnaire and distributed to all respondents via a google form (Bolarinwa, 2015; Taherdoost, 2016).

### Procedure

This research study adopted quantitative research design with an associative model (causal relationship) implemented through a survey approach (Pandey, 2016; Pócza, 2018). Based on the normality test, the data was normally distributed at alpha level 0.05 (Suliyanto, 2011). Additionally, the multicollinearity and heteroscedasticity tests were conducted which showed that the regression model did not have a problem (Herdiana, 2018; Suliyanto, 2011).

### Data Analysis

The data analysis including the hypothesis testing and path analysis was carried out using SPSS (Carrión et al., 2017; Kite & Whitley, 2018; Lleras, 2005). The standard z score was used to calculate the path number (Kite & Whitley, 2018; Lleras, 2005), while the Sobel test analysis with an online calculation was used to determine the significance value of the indirect effect (Bruce & Yearley, 2006).

## Results

The following are the results of data processed using two approaches of regression analysis model (Carrión et al., 2017; Kite & Whitley, 2018). The regression results of Model, I am listed below in Table 1:

**Table 1.** Model Summary Regression I

Model I	(Constant)	TT	LS	TE	R	R Square
B	51.563	0.078	0.388	-0.023	0.474 <sup>a</sup>	0.225
Std. Error	9.503	0.051	0.099	0.049		
Beta		0.156	0.404	-0.047		
t	5.426	1.530	3.909	-0.467		
Sig.	0.000	0.130	0.000	0.642		

a. Predictors: (Constant), TE, TT, LS

b. Dependent Variable: WM

Table 1 reveals that the standardized coefficient (beta) value for teacher's training was measured as 0.156 with a significance value of 0.130, greater than 0.05 (p-value). The percentage contribution to this effect, therefore, was 15.6%, which means there was no significant effect between teacher training and work motivation. The leadership's path standardized beta coefficient value is 0.404 (40.4%) with a significance value of 0.000 smaller than 0.05. This indicates leadership influences work motivation. Lastly, teacher experience has a standardized path coefficient beta of -0.047 (-4.7%) with a significance of 0.642 greater than 0.05, which indicates no influence of teacher's experience on work motivation (Kite & Whitley, 2018; Lleras, 2005). Table 1 also shows that the R<sup>2</sup> value in Regression Model I is 0.225, and the residual value is  $\sqrt{1 - 0.225} = 0.880$ . Therefore, the regression model I is a substructure equation:  $Y = 0.156X_1 + 0.404X_2 - 0.047X_3 + 0.880$  (Carrión et al., 2017).

Table 2 presents the results of Regression Model II as suggested by (Carrión et al., 2017; Kite & Whitley, 2018; Lleras, 2005):

**Table 2.** Model Summary Regression II

Model II	(Constant)	TT	LS	TE	WM	R	R Square
B	86.051	0.219	-0.619	-0.098	-0.223	0.163 <sup>a</sup>	0.027
Std. Error	38.617	0.179	0.375	0.170	0.392		
Beta		0.143	-0.057	-0.066	-0.073		
t	2.228	1.223	-0.450	-0.578	-0.568		
Sig.	0.029	0.225	0.654	0.565	0.572		

a. Predictors: (Constant), WM, TE, TT, LS

b. Dependent Variable: TC

Table 2 reveals that teacher training beta value was 0.143 with a significance value of 0.225, which is greater than 0.05 (p-value). This means teachers' training did not affect teachers' competence. Moreover, the percentage contribution to this influence was found to be 14.3%, hence no influence of teacher training on their competency as well. Leadership scored a standardized coefficient beta of -0.057 (-5.7%), with a significance value of 0.654 greater than 0.05. Therefore, leadership was said to have a significant influence on teacher competency (Kite & Whitley, 2018; Lleras, 2005).

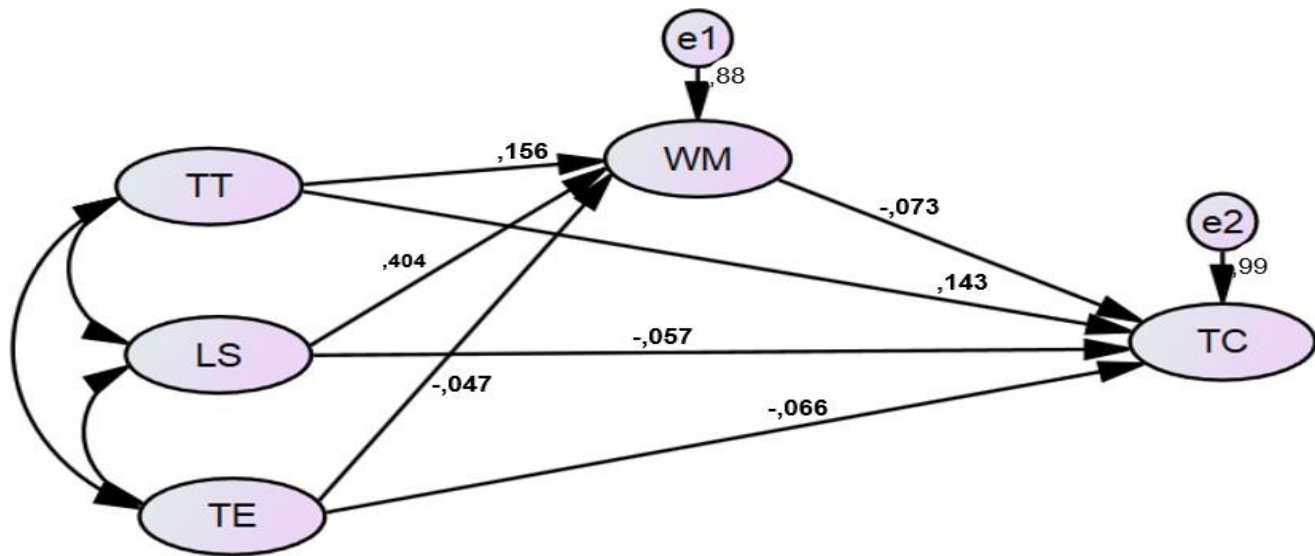
Similarly, teacher's experience path coefficient beta is -0.066 (-6.6%) with a significance of 0.565 greater than 0.05, while work motivation standardized beta is -0.073 (-7.3%), with a significance value of 0.572 greater than 0.05. Therefore, both teacher's experience and work motivation do not affect teacher's competence (Carrión et al., 2017; Kite & Whitley, 2018; Lleras, 2005). The R<sup>2</sup> value in Regression Model I is 0.027 and the residual value is  $\sqrt{1 - 0.027} = 0.987$ . Therefore, the regression model II substructure equation shows:  $Y = 0.143X_1 - 0.057X_2 - 0.066X_3 - 0.073X_4 + 0.987$  (Carrión et al., 2017).

As the next step, the Sobel test was conducted to explain the significance value of the indirect effect with the mediating variable (Bruce & Yearley, 2006).

**Table 3.** Sobel Test

Indirect	Test Statistics	Std. Error	p-value
TT – WM – TC	-0.533	0.032	0.594
LS – WM – TC	-0.563	0.154	0.573
TE – WM – TC	0.362	0.024	0.717

Table 3 shows a significant p-value of 0.504 on the effect of teacher training on competency through the mediation of work motivation, which is greater than 0.05. Therefore, it was evident that work motivation as a mediator did not influence the relationship between teacher training and competency (Bruce & Yearley, 2006). Similarly, the leadership effect on teacher competency, mediated by work motivation, was found 0.573, greater than 0.05. This means the role of work motivation as a mediating variable did not influence the effects of leadership on teacher competency. Lastly, the effect of teacher experience on their competency, when mediated by work motivation was scored 0.717, greater than 0.05. This also suggests work motivation cannot influence teacher experience against competency (Carrión et al., 2017). The research model of these results is presented in Figure 1:



**Figure 1.** Model of Teacher Competence in Technology-Based Education

Where TT = Teacher Training; LS = Leadership; TE = Teaching Experience; WM = Work Motivation; TC = Teacher Competency

### Discussion

Education and training programs should aim at improving a teacher's abilities and capacity building (Taylor et al., 2019). The program's success is measured through the implementation of education and training activities (Blimpo & Pugatch, 2019; Ruijgrok-Lupton et al., 2018). Hence, the achievements of Education and Training program are seen from the total value achieved during the process. This is related to work motivation which has a point of view different from the relationship (Wesman, 2013). The results of this study revealed that education and training did not affect work motivation, which are consistent with those of (Taylor et al., 2019; Weyns et al., 2021). However, it is quite possible that education and training may have a little or more effect on work motivation based on different samples of the study (Prasertcharoensuk et al., 2015; Weyns et al., 2021).

Leadership is the ability to lead, control, and direct existing resources to achieve predetermined goals (Sisca et al., 2020). It involves influencing others and can be understood when leaders have achievable goals using all available resources (Navaridas-Nalda et al., 2020). However, an achievable target cannot be different from a subordinate's role. A leader should therefore outline the targets to his subordinates along with proper motivation (Boud et al., 2016; Engin, 2020). Osman and Warner (2020) believed that leadership exerted an overall conceptual influence on employees and work motivation. This is why a school principal should influence subordinates, motivate them, and act as an example to teachers (Veletić & Olsen, 2021; Zhu et al., 2020). A leader, therefore, directly or indirectly, affects a teacher's competence through good or bad work motivation (Liu & Werblow, 2019; Navaridas-Nalda et al., 2020).

Work experience is the ability acquired after doing the assigned activities. Thus, the more teachers practice teaching and learning activities, the higher work experience they gain. Likewise, teaching experience is the duration for which a teacher works as an educator following the assignment of the authorized institution (Graham et al., 2020). Experience is closely related to seniority; hence, a senior teacher has more experience (Bürgener & Barth, 2018) as his or her experience is characterized by age, number of years worked, and like. An older teacher therefore may have more seniority (Ayuning, 2018). However, based on empirical data, teaching experience does not affect work motivation.

Some of these results might differ and contradict to the empirical findings, which may be due to pedagogic, personal, and social competencies (Boud et al., 2016). These competences are developed through education and training programs designed to improve the quality of human resources, although they may not always affect teacher competence. It is undoubtedly the teacher's teaching experience that contributes significantly to teacher work motivation. This is consistent with the findings of (Ayuning, 2018) who asserted that teaching experience, motivation, and academic qualifications significantly affect competence. Therefore, a teacher's competence is determined by the experience gained during their career and grows through work motivation (de Laurentiis Brandão, 2021).

Teaching experience helps teachers to pre-condition the class and meet the expected learning objectives (Akiba & Liang, 2016; Csíkos et al., 2018; Louws et al., 2017). However, based on accounting teachers' competences, teaching experience alone cannot vouch for the knowledge and other skills of a teacher. Teachers also need to use technology-assisted facilities and gadgets to design more focused teaching procedures for students (Cavenett, 2013; Nousiainen et al., 2018). Teaching experience also does not only determine a teacher's competence because a teacher's knowledge or skills depend more on self-development initiatives or whatever a teacher equips himself or herself with in addition to his or her competences. Lastly, teachers' competences and teaching applications have global relevance. Hence, it is important to have a global teaching model that recognizes relevant teaching applications, integrates global education modes, increases critical and cultural understanding among students, and encourages intercultural collaboration for transformative action (Kim et al., 2017; Sisca et al., 2020).

Work motivation has rightly been defined as the passion to perform a task (Bjekić et al., 2014; Osman & Warner, 2020). A high motivation for accounting teachers for their work will certainly make a positive impact on their work. Moreover, work motivation and competence of accounting teachers are two complementary aspects, because they can simultaneously be owned by a teacher (Slemp et al., 2020). Therefore, high work motivation can stimulate high enthusiasm among teachers, which can help teachers conduct activities and increase their competence (Nousiainen et al., 2018). However, the work motivation of accounting teachers does not directly influence their competence, as stated by (Shafi et al., 2020).

### **Conclusion**

This study has provided sufficient evidence which show that accounting teachers' competence is empirically and directly influenced by work motivation, but indirectly by principal leadership. However, the development of accounting teachers' competence through technology-assisted education is a coaching process to understand technology integration. Hence, for teachers to be well informed with technology assisted teaching aids, efforts should be made to design innovative teaching procedures for students. The competencies of accounting teachers identified are pedagogical, technological, collaborative, and creative, which are integrated to achieve continuous learning. These results of continuous development aim at improving teachers' learning through in-service training. Hence, it is recommended that teacher competence in technology-assisted education should be more integrated with reliable knowledge and a repertoire of accounting teacher's expertise. Moreover, since teachers and teaching applications have global competence, the teaching model should also be characterized by global relevant applications, globally integrated education, critical cultural understanding, and intercultural cooperation for transformative action).

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