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TRAINING EFFECTIVENESS AND TEACHER'S COMPETENCE: INSIGHTS FROM VOCATIONAL EDUCATION TRANSFORMATION IN MAJALENGKA REGENCY

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ABSTRACT
This study aims to analyze the contribution of training program effectiveness to the improvement of teachers' competence within the context of vocational education transformation in Majalengka Regency. A quantitative approach was employed using the Partial Least Square Structural Equation Modeling (PLS-SEM) method to analyze data obtained from all vocational high school (SMK) teachers in Majalengka Regency. The findings revealed that all indicators of training effectiveness and teacher competence demonstrated strong validity and reliability. The analysis showed that training effectiveness explains 43.9% of the variance in teacher competence, indicating a strong influence. Hypothesis testing further confirmed that training effectiveness significantly contributes to enhancing teacher competence. These results underscore the importance of implementing effective and sustainable training programs to strengthen vocational teachers' competencies in responding to the challenges of educational transformation. The study provides strategic implications for education policymakers in improving the quality of human resources within the vocational education sector

Key words: training effectiveness, teacher competence, vocational education, educational transformation

INTRODUCTION

Indonesia is projected to experience a demographic bonus that presents an opportunity to become a developed nation (Puspa et al., 2023). This potential can serve as a momentum to accelerate national development, particularly in the area of human resource (HR) quality, as skilled and competent human capital is a key determinant of national progress. According to the IMD World Talent Ranking 2023, Indonesia's labor competitiveness increased from rank 51 to 47 out of 64 countries, reflecting the country's improving human capital quality (Institute for Management Development, 2023). Schools play a pivotal role in human resource development, where teachers act as the most influential factor in driving student achievement (Turetsky et al., 2021; Goddard et al., 2021). Beyond transferring knowledge, teachers are responsible for shaping students' character in alignment with educational goals. Regardless of how well-designed a curriculum or how advanced the learning facilities are, without competent teachers, educational objectives remain difficult to achieve (Angin & Edwina, 2022). Based on official data from the Indonesian Ministry of Education and Culture, the total number of teachers in the first semester of the 2024/2025 academic year reached 3,432,460 nationwide, with West Java Province having the largest number, totaling 482,301 teachers (Muhamad, 2024).

Although Indonesia has over three million teachers, their competence remains relatively low. The UNESCO Global Education Monitoring (GEM) Report (Edwards et al., 2018) ranked Indonesia's education quality 10th out of 14 developing countries, and teacher quality 14th out of 14. The Human Development Index (HDI) data (as cited in Said, 2020) also indicate that the current level of teacher competence in Indonesia is insufficient to support fundamental reforms such as implementing the Competency-Based Curriculum (KBK). The quality of teachers in Indonesia is considered stagnant, according to the Regional Education Balance Sheet (NPD) data released in 2022, which reported that the average Teacher Competency Test (UKG) score was 54.05, still below the minimum standard of 55 (Hilmiatussadiah et al., 2024). Furthermore, according to 2019 Databoks statistics, the proportion of certified teachers remains under 50%, with details as follows: primary school (45.77%), junior high school (48.44%), special education (45.07%), senior high school (41.09%), and vocational high school (28.49%) (Jayani, 2019).

According to Law No. 14 of 2005 on Teachers and Lecturers (as cited in Ifriani et al., 2024), teacher competence encompasses four dimensions: pedagogical, professional, personal, and social. First, pedagogical competence involves the ability to understand student characteristics, design engaging learning activities, and integrate technology effectively. Second, professional competence reflects a teacher's responsibility and professionalism in achieving educational objectives. Third, personal competence requires teachers to serve as positive role models, while fourth, social competence concerns the ability to interact effectively with students, colleagues, and the community (Veirissa, 2021). These four competencies are essential for vocational school teachers to prepare students to meet industry standards and workforce demands.

This condition highlights the need for research, as teacher competence has a substantial impact on the teaching and learning process, influencing both student motivation and learning outcomes (Suwandi, 2020; Titu et al., 2023). If not addressed, declining teacher competence may lead to reduced student achievement and a further decline in national education quality. According to Sutermeister (1976), individual competence is influenced by knowledge, skills, experience, training, and motivation. This study specifically examines the contribution of training program effectiveness to improving teacher competence using a quantitative approach.

The scope of this research focuses on the contribution of training effectiveness to improving teacher competence at the vocational high school (SMK) level. The study assesses training effectiveness based on teachers' perceptions and evaluates competence improvement in pedagogical, professional, personal, and social aspects, as defined by Law No. 14 of 2005 (Ifriani et al., 2024). The research is limited to West Java Province, which has the highest number of teachers in Indonesia. Factors outside training effectiveness such as educational background, school conditions, or national education policies, are excluded from the study's scope.

METHOD

This research employs a quantitative approach using an explanatory survey method. This approach was selected to analyze the causal relationship between training effectiveness and teacher competence enhancement. The explanatory design enables the researcher to statistically test hypotheses and explain the influence of the independent variable on the dependent variable (Creswell & Creswell, 2018).

The population of this study comprises all vocational high school (SMK) teachers in Majalengka Regency, West Java. The sampling technique used was random sampling, resulting in 225 respondents, a number that meets the minimum requirement for multiple regression analysis as suggested by Hair et al. (2020), which is 5–10 times the number of indicators studied. Data were analyzed using Partial Least Square Structural Equation Modeling (PLS-SEM) with the assistance of statistical software.

RESULTS AND DISCUSSION

This study aimed to analyze the contribution of training effectiveness to the improvement of teacher competence. Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM), which allows simultaneous testing of causal relationships among latent constructs in both the measurement (outer model) and structural (inner model) components.

The evaluation of the outer model aimed to assess the validity and reliability of the constructs used in this study. The results of the convergent validity test showed that all indicators of the Training Effectiveness variable (X) had outer loading values ranging from 0.573 to 0.833, while the indicators of the Teacher Competence variable (Y) ranged from 0.586 to 0.838. According to Ghozali (2014), outer loading values ≥ 0.5 indicate that the indicators are valid in representing their respective constructs. Thus, all indicators of both variables met the criteria for convergent validity.

Discriminant validity was assessed using the Fornell-Larcker Criterion and the Heterotrait-Monotrait Ratio (HTMT). The Fornell-Larcker results (Table 1) showed that the square root of AVE for the Training Effectiveness variable was 0.760 and for Teacher Competence was 0.743—both higher than the inter-construct correlations (0.663). This satisfies the Fornell and Larcker (1981) criterion, which states that discriminant validity is achieved when the square root of AVE for each construct is greater than its correlations with other constructs.

Meanwhile, the HTMT ratio results (Table 2) showed a value of 0.683, which is below the 0.90 threshold (Gold et al., 2001). Thus, it can be concluded that both constructs have good discriminant validity, indicating that Training Effectiveness and Teacher Competence are empirically and conceptually distinct constructs.

Table 1. Fornell-Larcker Criterion

	TE (X)	TC (Y)
TE (X)	0.760	
TC (Y)	0.663	0.743

Table 2. Heterotrait-Monotrait (HTMT)

	TE (X)	TC (Y)
TE (X)		
TC (Y)	0.683	

Construct reliability was assessed through Cronbach's Alpha, Composite Reliability, and Average Variance Extracted (AVE). The results (Table 3) showed that the Training Effectiveness variable had a Cronbach's Alpha of 0.955 and Composite Reliability of 0.960, while Teacher Competence had 0.951 and 0.956, respectively. All values exceeded the minimum threshold of 0.7 (Hair et al., 2021), indicating excellent reliability. The AVE values were also above 0.5, with 0.577 for Training Effectiveness and 0.551 for Teacher Competence, indicating that more than 50% of the indicator variance was explained by their respective constructs. Therefore, all constructs were deemed both reliable and convergently valid.

Table 3. Construct Reliability

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
TE (X)	0.955	0.962	0.960	0.577
TC (Y)	0.951	0.955	0.956	0.551

The evaluation results (Table 4) revealed that the Standardized Root Mean Square Residual (SRMR) value was 0.071, which is lower than the ideal limit of 0.10. This suggests a good fit between the theoretical model and the empirical data (Hair et al., 2021). Additionally, the Normed Fit Index (NFI) value of 0.691 indicates that the model is sufficiently representative, though not perfectly fitted. Thus, the model can be considered valid and suitable for further analysis.

Table 4. Model Fit

	Saturated model	Estimated model
SRMR	0.071	0.071
d_ULS	3.394	3.394
d_G	2.117	2.117
Chi-square	2.348.148	2.348.148
NFI	0.691	0.691

The R-square value (Table 5) for the endogenous variable Teacher Competence was 0.439, meaning that 43.9% of the variation in teacher competence can be explained by training effectiveness. The remaining 56.1% is explained by other factors outside the model, such as teaching experience, work motivation, organizational support, and school environment. The adjusted R-square value of 0.436 indicates that the model is stable and not overfitted. According to Hair et al. (2021), an R^2 value of 0.436 falls within the moderate category, suggesting that training effectiveness has a substantial influence on teacher competence.

The f-square value (Table 6) of 0.782 demonstrates a large effect size, signifying that training effectiveness has a strong and substantial impact on teacher competence. In other words, effective training significantly contributes to the professional development of teachers in vocational education.

Table 5. R-Square

	R-square (R^2)	R-square adjusted
TC (Y)	0.439	0.436

Table 6. F-Square

	TE (X)	TC(Y)
TE (X)		0.782
TC (Y)		

The hypothesis testing results (Table 7) revealed that the path coefficient between Training Effectiveness and Teacher Competence was 0.663 with a t-statistic of 15.173 and a p-value of 0.000, which is far below the 0.05 significance level. Since $t > 1.97$ and $p < 0.05$, the hypothesis is accepted. Therefore, training effectiveness significantly contributes to the improvement of teacher competence.

Table 7. Hypothesis Test Results

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
TE → TC	0.663	0.668	0.044	15.173	0.000

The findings confirm that training effectiveness plays a crucial role in enhancing teacher competence. This aligns with prior studies emphasizing that systematically designed and contextually relevant training programs can significantly improve teachers' pedagogical, technological, and social competencies in the workplace (Zhao, 2024; Ramos et al., 2022).

High training effectiveness is indicated by factors such as well-planned programs, alignment of materials with participants' needs, quality of trainers, and follow-up activities after training. In this study, the high outer loading values (0.77–0.83) demonstrate that these indicators accurately represent the construct of training effectiveness.

The R-square value of 0.439 indicates that nearly half of the variation in teacher competence is explained by effective training implementation. This demonstrates that training not only functions as a means to enhance technical capacity but also helps shape teachers' mindsets, creativity, and adaptability to the demands of 21st-century education. Moreover, the large f-square value (0.782) reinforces the empirical evidence that training effectiveness substantially impacts teacher competence. This is consistent with Wood et al. (2017), who found that teacher training effectiveness directly improves content knowledge, instructional ability, and student learning outcomes.

The discriminant validity tests (Fornell-Larcker and HTMT) also confirmed that each construct is unique. Training effectiveness, as a form of professional learning, does not overlap with teacher competence but serves as an external factor that strengthens it. Furthermore, the model fit (SRMR = 0.071) indicates that the model sufficiently represents the empirical data. Although the NFI value (0.691) does not indicate perfect fit, the model is considered stable and acceptable for representing the relationship between training effectiveness and teacher competence.

Practically, these findings offer important implications for educational institutions and teacher training providers. Training effectiveness is not determined merely by frequency but by quality—specifically, the relevance of training materials, the use of active learning methods, and support for implementation in real teaching contexts. Reflective and collaborative training programs have been shown to be more effective in enhancing teachers' pedagogical and professional competencies (Chung, 2023; Ramos et al., 2022).

From a theoretical standpoint, this study reinforces the notion that teacher competence results from the integration of formal education and ongoing professional development. Effective training functions as a transformative mechanism that enables teachers to update their knowledge, enhance critical thinking, and adopt innovative learning technologies.

Although the contribution of training to teacher competence is substantial, 56.1% of the variation is influenced by other factors beyond training. These factors may include teaching experience, managerial support, school organizational culture, and intrinsic motivation. Therefore, a more comprehensive approach to teacher professional development is required, not only focuses on training but also considers workplace context and institutional support systems.

CONCLUSION

It can be concluded that the effectiveness of training programs significantly contributes to improving teacher competence in public vocational schools in Majalengka Regency. The analysis shows that training effectiveness explains 43.9% of the variance in teacher competence, indicating a strong relationship between the two variables. Thus, this study emphasizes that well-planned, relevant, and continuous training programs play a vital role in developing vocational teachers' professional and digital competencies. These findings provide strategic implications for education policymakers, particularly in designing adaptive training programs that respond to the needs of educational transformation and enhance human resource quality in the vocational education sector.

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