



Analysis of the Effect of Teacher Competency and Certification on Teacher Performance: Approach from the Economic Education Teacher Professional Education Program at UNNES

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Abstract. This article aims to analyze the influence of teacher competency and certification on teacher performance, using the Economic Education Teacher Professional Education Program approach at Semarang State University (UNNES). The research was conducted using a survey method of teachers who had participated in the professional education program at UNNES. Data collection is carried out through questionnaires that measure teacher competency levels, certification status, and teacher performance assessments. The results of the analysis show that there is a positive relationship between teacher competence and teacher performance, where teachers who have a higher level of competence tend to show better performance. This is shown by: (1) There is a significant direct relationship between teacher competence and teacher performance, with a path coefficient of 0.480 with a t-statistic of $2.925 > 2.01$ with a p-value of $0.004 < 0.05$; (2) There is a significant direct relationship between teacher certification and teacher performance, with a path coefficient of 0.478 with a t-statistic of $2.812 > 2.01$ with a p-value of $0.005 < 0.05$. The implications of these findings can be used to emphasize the importance of increasing teacher competency and qualifications to increase the effectiveness of teacher training programs and improve the quality of education.

Keywords: Competency, Certification, Teacher Performance, Teacher Professional Education Program

1 Introduction

Improving the quality of education is one of the main focuses of efforts to advance human resources in Indonesia. In this case, teachers' role is vital because they are the

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spearheads of the learning process[1,2]. Teacher competency and professional certification are considered two important factors that can significantly influence teacher performance[3,4]. The Teacher Professional Education Program (PPG) is designed to improve the professional competence of teachers in Indonesia[5–7].

Education has an undeniable role in the formation of an intelligent and developed society[8,9]. In the midst of the dynamics of the world of education, teachers are a key element that plays a central role in conveying knowledge to the younger generation. However, to achieve the goal of quality education, teacher performance plays an important role. Teacher performance is influenced by a number of factors, including teacher competence, motivation, and welfare[10–12].

The Teacher Professional Education Program (PPG) is one of the government's efforts to increase the competency and professionalism of teachers in Indonesia[13–15]. This program is designed to provide training and certification to prospective teachers so that they are ready to face challenges in the world of education. At Semarang State University (UNNES), PPG Economic Education is one of the programs that focuses on increasing teacher competency and certification in the field of economic education.

The PPG program contributes to increasing teacher competency, which covers various aspects such as mastery of subject matter, learning methods, class management, use of technology in learning, and increasing teacher professionalism[16,17]. The competence of a teacher is closely related to better student learning outcomes. Mastery of the knowledge and behavior required by a teacher is known as teacher competency. This involvement is necessary so that a teacher can occupy a functional position in accordance with their field of duties, qualifications, and level of education. This involvement shapes the teacher's professional performance, which includes mastery of the material, student understanding, educational learning, personal and professional development, as well as improving the learning process[18–20]. It is hoped that teacher performance will increase by combining the concepts of teacher competency.

Teacher certification has become the focus of efforts to improve the quality of education in various countries, including Indonesia. Teacher certification is an assessment process carried out to determine whether a teacher has the competencies and qualifications in accordance with established standards[21,22]. However, there is still debate regarding the extent to which teacher certification affects their performance. Teacher certification is an important indicator of teacher quality. Teacher certification is an important component in ensuring that a teacher meets established professional standards. This certification aims to formally recognize teachers' competence and expertise so as to increase their credibility and professionalism in the world of education[23,24].

Certified teachers tend to demonstrate a higher level of professionalism, including in terms of responsibility, work ethic, and commitment to their profession. By increasing pedagogical, professional, personal, and social competencies, teachers can be more effective in teaching, which contributes to increasing student academic achievement[25,26]. Certification is often associated with additional financial benefits, which can improve teacher well-being. The existence of teacher certification encourages teachers to continue to develop themselves through training and continuous education. Certified teachers often serve as models for their peers, driving overall improvement in the teaching profession.

Certification helps standardize the quality of education, ensuring that all teachers meet the minimum standards required for teaching. Providing tools for governments and educational institutions to evaluate and improve the overall quality of education[27–29]. Certification opens up opportunities for promotion, providing a clearer and more prospective career path.

Improving teacher performance in Indonesia through teacher certification is based on several conditions in the world of education that are expected to motivate teachers to become certified. Certification program to improve teacher quality in an effort to improve the quality of education. Logically, if good teacher quality is combined with a high salary, the teacher's work results are also expected to be better[30,31]. Teachers have a strategic role in the field of education. Even other adequate resources are often meaningless if they are not accompanied by high-quality teachers. If high-quality teachers do not receive adequate support from other supporting resources, teacher performance can also be less than optimal[32,33].

This research aims to analyze the influence of teacher competency and certification on the performance of teachers who have participated in the PPG program at UNNES. Understanding this relationship can provide deeper insight into the effectiveness of the PPG program in improving the quality of education, especially in the field of economic education.

2 Method

The research method used in this study is quantitative research. A quantitative approach measures and analyzes the relationship between teacher competency variables, teacher certification, and teacher performance. This method allows researchers to obtain numerical data that can be analyzed statistically to identify significant patterns or relationships[34–36]. The population of this research is Economic Education teachers who have taken part in the Teacher Professional Education Program (PPG) at Semarang State University (UNNES).

The research sample was taken using a purposive sampling technique, with the criteria being 45 teachers who had taken PPG, had certification as economic education teachers, and had taught for at least two years. Data was collected through a questionnaire adapted from an instrument tested for validity and reliability. The data collected will be analyzed using statistical analysis techniques appropriate to the research objectives.

Multiple linear regression analysis was used to test the relationship between the independent variables (teacher competency and teacher certification) and the dependent variable (teacher performance). Using this technique, we can assess how much influence each independent variable has on the dependent variable and whether this influence is statistically significant. The results of multiple linear regression analysis will show the regression coefficient for each independent variable, which indicates how much of the change in the dependent variable can be explained by the change in the independent variable.

3 Results And Discussion

3.1 Respondent Data

Based on gender, respondent data is as follows:

Table 1. Respondent Gender Data

No.	Gender	f	Percentage (%)
1.	Male	15	33.33 %
2.	Female	30	66.67 %
	Total	45	100 %

Table 1 shows that there were 15 male respondents, or 33.33% of respondents, while there were 30 female respondents or 66.67%. Thus, the total sample in this study was 45 teachers with economic education midwives who had implemented Professional Teacher Education (PPG) at UNNES.

3.2 Validity Test

The validity test carried out in this research used the Loading Factor, Average Variance Extracted (AVE), and Cross Loading. First, the validity criteria with the Loading Factor value can be seen as follows:

1. If the Loading Factor value > 0.7, then the questionnaire item is valid.
2. If the Loading Factor value < 0.7, the questionnaire item is invalid.

After carrying out calculations using SmartPLS, the following results were obtained:

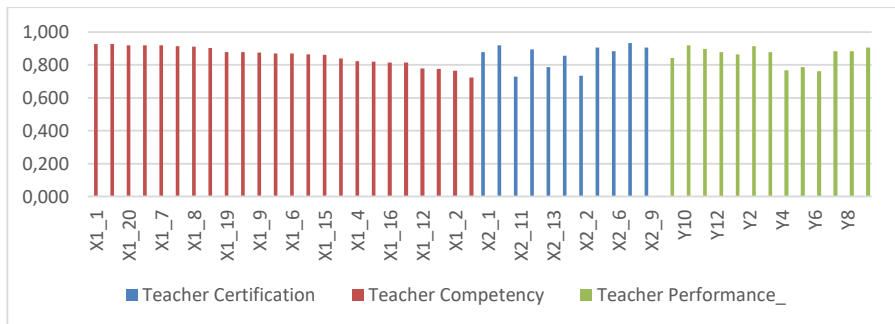


Figure 1. Factor Loadings for All Items

From the loading factor results above, it can be seen that all questionnaire items have a value of more than 0.7, which means all the indicators are valid. The next stage is the

validity test using the Average Variance Extracted (AVE) value. Validity decision criteria with the Average Variance Extracted (AVE) value can be seen as follows:

1. If the AVE value > 0.5, then the questionnaire item is valid.
2. If the AVE value <0.5, then the questionnaire item is invalid.

After carrying out the calculations, the following results were obtained:

Table 2. Average Variance Extracted (AVE)

Variable	Average Variance Extracted (AVE)
Competency	0.739
Certification	0.740
Performance	0.743

Based on the results as shown in the table above, all variables have an AVE value greater than 0.5, which means that Competency, Certification, and Performance are said to be valid. Considering that the item validity test has been proven to be completely valid, everything in the variable validity test, as shown in the table above, has also been proven to be valid because all variables have an AVE value above 0.5. Thus, all variables can be used to test hypotheses using inferential statistics.

Hypothesis testing uses inferential statistics, including Discriminant Validity Cross Loading. The Cross-Loading value represents the correlation between each construct and its indicators and indicators from other non-construct blocks. A measurement model has good discriminant validity if the correlation between a construct and its indicators is more significant than other constructs. The following results were obtained after the data was processed as follows:

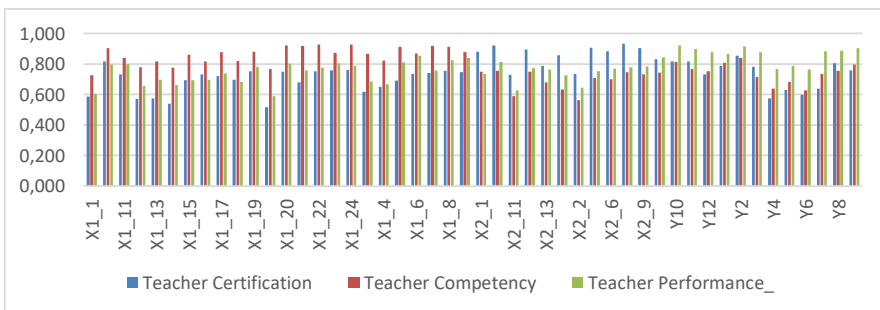


Figure. 2. Discriminant Validity Cross Loading

The cross-loading results in Table 2 above show that the correlation coefficient between the construct and its indicators is greater than the correlation coefficient between the construct and other constructs. Thus, all constructs or latent variables already have high discriminant validity, as evidenced by the superiority of the construct indicator block compared to other indicator blocks.

3.3 Reliability Test

In this research, reliability testing was carried out using Composite Reliability and Cronbach Alpha. The decision criteria for reliability testing with composite reliability can be seen as follows:

1. If the Composite Reliability value > 0.7 , then the questionnaire item is reliable.
2. If the Composite Reliability value < 0.7 , then the questionnaire item is not reliable

The decision criteria for reliability testing with Cronbach Alpha can be seen as follows:

1. If the Cronbach's Alpha value is > 0.7 , then the questionnaire items are reliable.
2. If the Cronbach's Alpha value is < 0.7 , then the questionnaire items are not reliable.

The following are the results of the composite reliability and Cronbach alpha calculations:

Table 3. Composite Reliability and Cronbach's Alpha

Variable	Cronbach's Alpha	Composite Reliability
Competency	0.986	0.964
Certification	0.969	0.984
Performance	0.974	0.971

The composite reliability results shown in the table above show that all composite reliability values for each construct have a value greater than 0.7, which means all of the constructs are reliable. It can be seen that Cronbach's alpha value for all constructs is more significant than 0.7, which means that all constructs are reliable.

3.4 Path Coefficient

Bootstrapping analysis in Smart-PLS produces the value contained in the coefficient for each relationship between the highest values, which can be seen from the relationship between Teacher Competency and Teacher Performance, with a value of 0.480. The following are the results of the path coefficient:

Table 4. Mean, STDEV, T-Statistics, and P-Values

	Original Sample	Sample Mean	Standard Deviation	T Statistics (O/STDEV)	P Values
Teacher Certification -> Teacher Performance	0.478	0.427	0.170	2.812	0.005
Teacher Competency -> Teacher Performance	0.480	0.531	0.164	2.925	0.004

The Determination Coefficient is used to determine the magnitude of the influence of the independent variable on the dependent variable. The value of the determination coefficient can be shown in the following table.

Table 5. Coefficient of Determination (R-Square)

	R Square	R Square Adjusted
Teacher Performance	0,830	0,822

Based on the table above, it can be seen that the R Square value is 0.830. This means that the ability to influence Teacher Competency and Teacher Certification as independent variables in explaining the Teacher Performance variable is 83.0%. In contrast, other factors outside the research demonstrate the other remaining values.

3.5 Structural Model Test (Hypothesis)

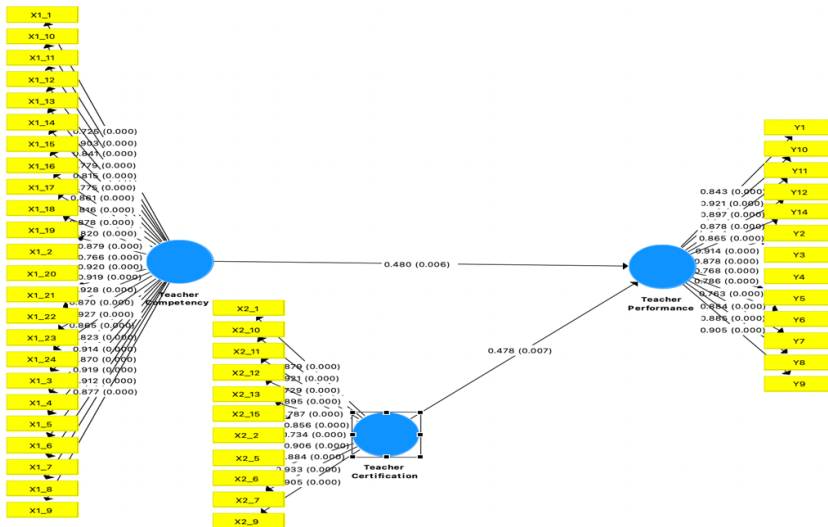


Figure. 3. Structural Model Test (Hypothesis)

The inner model test (Structural Model) tests the hypothesis, including path coefficients, parameter coefficients, and t-statistics. To determine whether a hypothesis is accepted or rejected, among other things, by testing the significance value between constructs, t-statistics, and p-values. Bootstrap results reveal these values. A t-statistic > 2.01 was used as a guideline in this study, along with a p-value of 0.05 (5%) and a positive beta coefficient. The table illustrates the value of testing the hypothesis of this research, and the diagram in Figure 3 depicts the results of this research model.

Based on the table above, the following is a discussion of the hypotheses tested:

1. The first hypothesis tests whether there is a direct influence between teacher competency and the performance of economic education teachers after implementing Professional Teacher Education (PPG) at UNNES. From the hypothesis test results, a path coefficient of 0.480 was obtained with a t-statistic of $2.925 > 2.01$ with a p-value of $0.004 < 0.05$, so that H_{01} was rejected and H_{a1} was accepted. There is a significant direct influence between teacher competency and the performance of economic education teachers after implementing Professional Teacher Education (PPG) at UNNES.
2. The second hypothesis tests whether there is a direct influence between teacher certification and the performance of economic education teachers after implementing Professional Teacher Education (PPG) at UNNES. From the hypothesis test results, the path coefficient is 0.478 with a t-statistic of $2.812 > 2.01$ with a p-value of $0.005 < 0.05$, so H_{02} is rejected, and H_{a2} is accepted. There is a significant direct influence between teacher certification and the performance of economic education teachers after implementing Teacher Professional Education (PPG) at UNNES.

Based on the results of the analysis of hypothesis testing and discussion, it can be concluded as follows:

First, there is a direct influence between teacher competency and the performance of economic education teachers after implementing Professional Teacher Education (PPG) at UNNES. From the hypothesis test results, a path coefficient of 0.480 was obtained with a t-statistic of $2.925 > 2.01$ with a p-value of $0.004 < 0.05$. The higher the competency teachers possess, the better their performance will be. Conversely, if teacher competence decreases, their performance will also decrease. Increasing teacher competency can be achieved through various means, such as training and professional development, coaching, and opportunities to continue learning and developing oneself. With better competence, teachers can manage classes more effectively, apply innovative teaching methods, and provide better guidance to students[37,38]. Conversely, if teachers do not get the opportunity to develop their competence or are not involved in continuous learning, their competence can decrease. This will hurt their performance, affecting student learning outcomes and the overall quality of education. Therefore, educational institutions and the government need to continue supporting teachers' professional development so that their competence remains high and their performance remains optimal[39].

Second, there is a direct influence between teacher certification and the performance of economic education teachers after implementing Professional Teacher Education (PPG) at UNNES. From the hypothesis test results, the path coefficient is 0.478 with a t-statistic of $2.812 > 2.01$ with a p-value of $0.005 < 0.05$. The better the meaning of teacher certification, the higher the teacher's performance, and conversely, the lower the meaning of teacher certification, the lower the teacher's performance. Certification indicates that a teacher has the competencies necessary to teach effectively[39,40]. This includes in-depth knowledge of the subject area, pedagogical skills, and the ability to manage the classroom and support student development. Teachers who have certification tend to show better performance[41,42]. They are more skilled in designing and implementing curriculum, using effective teaching methods, and evaluating student learning outcomes. They also tend to be more confident and motivated in teaching[43].

In conclusion, meaningful and high-quality teacher certification is essential to ensure that teachers have the competencies necessary to teach effectively.

4 Conclusion

Based on the results and discussion above, it can be concluded that teacher performance is directly influenced by competency and certification. This is shown by: (1) There is a significant direct relationship between teacher competence and teacher performance, with a path coefficient of 0.480 with a t-statistic of $2.925 > 2.01$ with a p-value of $0.004 < 0.05$; (2) There is a significant direct relationship between teacher certification and teacher performance, with a path coefficient of 0.478 with a t-statistic of $2.812 > 2.01$ with a p-value of $0.005 < 0.05$. Both teacher competency and certification have a significant influence on teacher performance. High teacher competency and meaningful certification both contribute to improved teacher performance.

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