The instructional and learning quality: The effect of four teacher competencies

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Abstract: Teacher competence is directly proportional to student learning quality. The purpose of this study was to prove whether teacher competence positively impacts the quality of learning. The study was conducted on 127 state madrasah teachers in Malang Regency and Batu City. Data was collected using a questionnaire via Google Form with a semantic differential scale (1-10). The instrument was developed in accordance with the teacher competence law and has met the quality requirements of content testing by experts and obtained empirical evidence in the SEM analysis with CFI (Comparative Fit Index) results, 0.926, RMSEA 0.110, CI (Confidence interval) 0.0937-0.126, and Reliability 0,95. The test of the influence of teacher competence on the quality of learning was carried out using linear regression analysis. The results of the data analysis obtained in the study showed a positive influence of teacher competence on the quality of learning by 90.8%. The results of measurements with the instrument used by the researcher can be a reference in measuring teacher competence;; the better the teacher's competence is, the more directly proportional it is to the quality of learning.

Keywords: learning quality; regression; teacher competency.

A. Introduction

Educators must have qualifications and competencies that follow the teaching authority level on Peraturan Menteri Pendidikan Nasional RI No. 16 Tahun 2007 on Academic Qualification Standards and Teacher Competencies. A teacher must have a fourth diploma (D-IV) or bachelor's degree (S1) academic qualification, as well as physical and spiritual health. Meanwhile, the competency in question is having the ability to realize and achieve national education goals. The Teacher and Lecturer Law Number 14 of 2005, article 10, paragraph (1) states that teachers must have

pedagogical, personality, social, and professional competencies obtained through professional education. These competency provisions are emphasized and reviewed in detail according to the function of teachers carrying out their duties in the learning process in Law Number 16 of 2007 Standards for Academic Qualifications and Teacher Competencies.

Teachers with their competencies are expected to have a big role in the quality of education Ayu Safitri, & Lina Amelia. (2015). The quality of education must be balanced with the learning process, which must be service-oriented to students. Learning focuses on learning outcomes by developing all students' potential. Quality learning cannot be separated from mentoring, training, and directing students to become competent in knowledge, technology, and noble personality (Kunter et al., 2013).

Another indicator of quality learning is that Habibullah & Nuri (2017) states that the implementation of learning is student-centered. In this case, it means that the teacher must be able to comprehensively evaluate himself (reflection), planning, process and implementation, and student achievements. The evaluation process of student achievement can begin with assessment as a diagnostic and at the end so that changes can be seen in implementing learning as a form of assessing student achievement (Amalia & Saraswati, 2018).

Teacher competency is reflected during learning and is a benchmark for a teacher's level of professionalism. Teachers as professionals must have special specifications so that their work can gain all parties' trust (Yuliany, 2019). Specific specifications in efforts to realize quality learning. Teachers must be able to design, plan, and reflect on their teaching practices (Pramswari, 2016).

According to Mukroni (2017), the quality of teacher learning can be seen in several aspects, namely curriculum, learning planning, learning facilities, and materials. The curriculum functions in determining the direction and atmosphere that students will face. If the direction and atmosphere of the class are interesting, fun, and meaningful, it can be concluded that the teacher has mastered the curriculum and has professional competence. Apart from that, the teacher's pedagogical competence will be seen in the success of learning planning through increasing the effectiveness and intensity of the learning process for students. In the aspect of learning facilities, it is of quality if the facilities provided provide security and comfort for students. Meanwhile, in terms of material, it is considered quality if the objectives and competencies provided are by student development.

The Indonesian curriculum is in a new era, namely the independent curriculum. The independent curriculum provides freedom and flexibility for teachers to provide quality learning according to the needs and environment of students. In carrying out their duties, teachers are responsible for developing character packaged in the Pancasila Profile, soft skills, and conducting learning based on essential material by formulating learning outcomes.

Implementation of the independent curriculum in 2023 has yet to reach 100%. Quoted in the Ditjen GTK Kemdikbud RI (2023) stated that currently, there are 256,568 schools. Of course, this number is very far from the total number of madrasas in Indonesia. The Ministry of Education and Culture has launched a supporting program related to the Independent Curriculum to implement it comprehensively. Kholik et al. (2022) stated that the Ministry of Education and Culture has several superior programs for accelerating the implementation of the independent curriculum. Some of them are the launch of the Merdeka Mengajar platform. This platform is intended for teachers and school principals. Through this platform, they will learn many things about the Independent Curriculum—funding support for implementing workshops and other workshops by presenting various competent speakers.

However, many literature reviews and direct observations found that the learning activities did not all run well. Several findings of the researcher's observations stated that teacher competencies had not been optimally implemented. Not only that, the results of observations showed that the abilities possessed by teachers were not fully possessed. This problem turned out to be not only a few groups of teachers based on age but all groups. Both young teachers with less than 10 years of experience and senior teachers with more than 10 years of experience. Of course, this problem will have a significant impact on the learning process, which will ultimately impact the quality of learning.

Research by Rosyada et al. (2021) shows a positive and significant correlation between teacher competence and the quality of learning. It means that high-quality education will follow if the teacher's competency is met and is in the very high category. However, the problem of teacher competency, closely related to the quality of learning, is very complex. Shows a positive and significant correlation between teacher competence and the quality of learning. It means that high-quality education will follow if the teacher's competency is met and is in the very high category. However, the

problem of teacher competency, closely related to the quality of learning, is very complex.

This problem is based on many factors. Initial observation findings in the research show that not all state madrasah teachers in Malang and Batu can prepare thorough plans, which aligns with the results (Daga, 2021). There is also the condition that teachers in Malang state madrasas can plan well but are unable to reflect in the form of evaluations that have been carried out (Sumarsih et al., 2022). Several of these factors are related to teachers' time management abilities. Adapt teaching materials to the various learning strategies applied.

Another problem related to the need for teacher competence in improving the quality of learning is the shadow of the need for large innovation funding. The cost of implementing quality learning is a supporting factor, meaning that although it is necessary, funding is not the main problem. With a mindset like that, teachers tend to teach as usual but must realize that participants' learning process needs are very complex (Pramswari, 2016). The learning process tends to be more varied and innovative.

Innovation requires relative costs if viewed from a funding perspective (Setiawan, dkk, 2023). Funding can be arranged so that without requiring a lot of financing, this creativity will emerge in teachers when they are determined to have high motivation so that learning will be of higher quality (Sukanti, 2014).

Research conducted by Maharani, E. C., Rosmiati, & Nasori, Ahmad (2021) and Basra & Saleh (2022) further strengthens that the teacher's ability to master learning activities in the classroom has a very positive influence on the quality of learning. In a lesson, the teacher must ensure they have mastered the knowledge competencies to facilitate the learning process, mastering pedagogical, personality, social, professional competencies, and other relevant abilities.

Research by Tsabitah & Fitria (2021), Rosyada et al. (2021) and Darwis et al. (2019) also strengthens the evidence that competent teachers can master the material and master learning activities well. Based on this description, the researcher intends to prove whether the competencies possessed by state madrasa teachers in Malang district and Batu City will impact the quality of learning. Apart from that, researchers will also establish whether the higher the teacher's competence, the higher the influence on the quality of learning.

B. Method

The research was conducted on 127 State Tsanawiyah Madrasah Teachers in Batu City and Malang Regency in July-November 2023. The research instrument (Teacher Competency) is a closed questionnaire prepared based on standard regulations based on the Teacher and Lecturer Law Number 14 of 2005 article 10 paragraph (1). The teacher competence instrument consists of 4 aspects of competence: professional competence, pedagogical competence, social competence, and personality competence. The research instrument was prepared using a differential semantic scale (1-10). The closer the number is to 10, the more positive the statement on the instrument will be. However, the opposite applies if the value approaches 1 in the response.

The instrument used has obtained good evidence of quality and feasibility. The first quality and feasibility test was carried out by three experts with the validity of the Aiken index with a result of 0.82. The following quality and feasibility test was by using CFA (Confirmatory Factor Analysis)-SEM (Structural Equation Model) with the results of CFI (Comparative Fit Index), 0.926, RMSEA 0.110, CI (Confidence interval) 0.0937-0.126, and Reliability 0.95 these results are very strong evidence for the instrument developed from 4 teacher competencies representing 20 questionnaire item indicators.

Research data collection was carried out using Google Formulir. The data that has been obtained is analyzed using linear regression analysis techniques via the Jamovi application software to test the hypothesis. The research hypothesis is, "Is there an influence of teacher competency on the quality of learning?". Regression testing is performed after the prerequisite tests have been met. The results of the data analysis were presented using descriptive techniques. The data presentation is in the form of a narrative regarding the regression testing results.

C. Result and Discussion

1. Result

This research aims to prove the influence of teacher competence on the quality of learning in realizing independent learning for students. Data collection through instruments was carried out using 20 instrument items that were declared valid and met reliability values by experts and empirical testing. Information on instrument

quality testing is proven by CFA analysis with a factor loading fit measure and a reliability value of 0.95.

The prerequisite tests in regression testing are the linearity, normality, and homogeneity tests. Prerequisite tests are presented as follows:
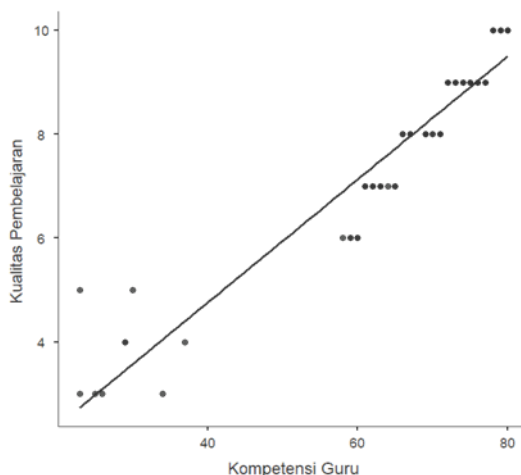

Figure 1. Linearity Test

The image above is a prerequisite test for linearity, which is achieved by looking at the analysis of the scatter plot graph. From the data distribution, the value of teacher competency (X) is also followed by the weight of Learning Quality (Y).

Another prerequisite test is the normality test. The following are the results of normality testing:

Table 1. Normality test

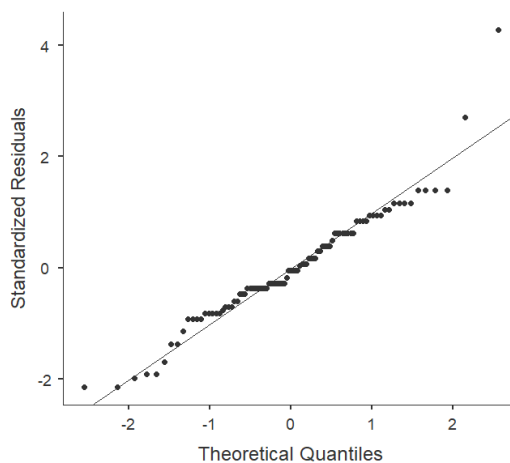| Normality Test (Shapiro-Wilk)	
Statistic	**p**
0.947	<.001

Figure 2. Normality Test

Table 1 and Figure 2 is the output of normality analysis results using the Shapiro-Wilk Technique. This test aims to determine whether the data obtained in the research meets a normal distribution.
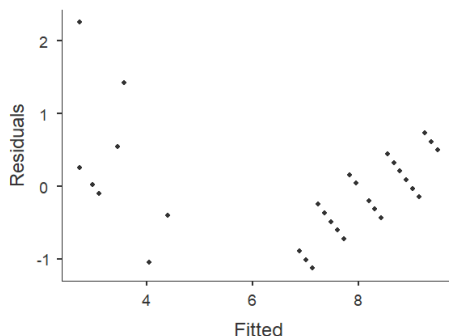

Figure 3. Homogeneity Test

The data converges in two places: This indicates a significant difference in the data variation between the groups being compared. There are at least two groups with significantly different variations. The data points will gather around two various centers or midlines, indicating that there are groups with greater variation than other groups. It can be concluded that the two data are not homogeneous or have differences between them (Usmadi, 2020).

Table 2. Cook's Distance

Cook's Distance				
			Range	
Mean	**Median**	**SD**	**Min**	**Max**
0.0269	0.00249	0.147	2.30e-5	1.37

Cook's distance, whose mean value is less than 1, indicates that the presence of outliers can be ignored, which means that the outliers do not disturb the regression line.

Table 3. Regression test

Model	R	R^2	**Overall Model Test**			
			F	**df1**	**df2**	**p**
1	0.953	0.908	902	1	91	<.001

The Model Fit Measures table shows a value of R=0.953, meaning a strong relationship exists between teacher competence and learning quality. To determine the contribution of variable X to Y, use the formula R Square x 100% = 0.908 x 100% = 90.8%. The gift of teacher competence to the quality of learning is 90.8%, while the

remaining 9.2% is contributed by other variables that were not researched or outside the scope of the research.

Table 4. Anova test

Omnibus ANOVA Test

	Sum of Squares	df	Mean Square	F	p
Kompetensi Guru	254.1	1	254.149	901	< .001
Residuals	25.7	91	0.282		

Note. Type 3 sum of squares

The Omnibus ANOVA Test table shows that the teacher competency variable's Sum of Squares (SS) value is greater than the Residual SS value. It indicates that teacher competency variables determine many learning quality variables. Meanwhile, Residual describes other variables that cannot be explained by researchers but contribute to the quality of learning.

Table 5. Coeficient Model

Model Coefficients – Learning Quality

Predictor	Estimate	SE	95% Confidence Interval Lower	95% Confidence Interval Upper	t	p	Stand. Estimate	95% Confidence Interval Lower	95% Confidence Interval Upper
Intercept	0.0108	0.27045	-0.526	0.548	0.0399	0.968			
Kompetensi Guru	0.1187	0.00395	0.111	0.127	30.0104	< .001	0.953	0.890	1.02

In linear regression model analysis we can know the coefficients a and b for the regression line equation Y = a + bX --> Y = 0.0108 + 0.1187X. Coefficients a and b are seen from the Estimate column.

2. Discussion

Hypothesis testing using linear regression analysis requires two variables, namely variable X as the independent variable and variable Y as the dependent variable. Variable X in this research is teacher competency, which consists of professional, pedagogical, social, and personality competencies. Meanwhile, the Y variable is the quality of learning. Testing the hypothesis in this research is whether there is a significant influence between teacher competence and the quality of education. The test criteria are if the p-value < α, then Ha is accepted. Regression testing can occur if the prerequisite tests have been met (Sembiring, 2003).

The linearity assumption is met with the linear regression equation model on figure 1 is Y=a+b x Y=a+bX (Sari et al., 2017). This test is to see the relationship in the research variables, namely the relationship between the independent and dependent variables. The existence of a relationship in the results of the linearity analysis will be able to

determine the regression model in the data analysis (Djazari et al., 2013) and (Lestari & Permatasari, 2023).

The Table 1 and Figure 2 above show that the statistical value is 0.947, and the p-value is less than 0.001. This means that the statistical significance (0.947) is a number produced by the normality test. However, there are no clear limits to interpreting this statistical value without looking at the p-value. When the data do not meet the normality assumption, regression analysis will give results different from the truth. It can happen because many events are out of the ordinary, for example, extreme data, sorted data, data following a distribution other than the normal distribution, and many other causes (Sari et al., 2017).

The normality test is needed to answer whether the requirements for a representative sample are met so that the research results can be generalized to or represent the population (Hadi, 2001). Larger or smaller statistical values do not directly indicate the direction of data distribution. Meanwhile, the p-value (< 0.001) measures statistical significance in hypothesis testing. We can reject the null hypothesis if the p-value is less than the pre-determined significance level (0.05). In this case, with a p-value smaller than 0.001, we can conclude that the data sample tested is normally distributed. There is strong enough evidence to reject the null hypothesis that the data comes from a population with a normal distribution. Another interpretation result that shows that the data normality is fulfilled is in the scatter plot. Figure 2 shows that the data is normally distributed (Widhiarso, 2010).

In Cook's distance table 2, Mean < 1 appears, meaning outliers do not disrupt the regression line. The presence or absence of outliers does not affect the reliability of the regression line. If the assumption of homoscedasticity is met, then the results of regression testing in the t-test and F-test will be able to estimate the influence between variables accurately according to the significance level of the test used (Setiawan & Kusrini, 2010).

Suppose the prerequisite tests are not met, both for normality and homogeneity. In that case, there are several ways, including adding the amount of data to the dependent variable (Y), removing data that is considered to be the cause of data abnormalities (outlier data), and carrying out data transformation (Sari et al., 2017). This Cook distance analysis indicates outlier data that will be analyzed in the regression model. The fulfilled regression model can be represented through this test with a low outlier value (Suharyanto, 2024).

The Model Fit Measures table 3 shows a value of R=0.953, meaning a strong relationship exists between teacher competence and learning quality. To determine the contribution of variable X to Y, use the formula R Square x 100% = 0.908 x 100% = 90.8%. The gift of teacher competence to the quality of learning is 90.8%, while the remaining 9.2% is contributed by other variables that were not researched or outside the scope of the research. This research results align with the study conducted by Fauth et al. (2019). Based on the results of this analysis, state madrasah teachers in Malang district and Batu City have a significant competency contribution to the quality of ongoing learning. However, other factors still cannot be controlled; in this case, they cannot be estimated using the regression model proposed in the research.

Several previous studies have been related to testing the influence of teacher competence on the quality of learning. All research results show that there is a positive influence, meaning that teacher competence has an impact on the quality of learning. The literature review that researchers have conducted on the impact of teacher competence on the quality of learning has a varying magnitude. Rosyada & Harapan (2021) stated the results of his research that teacher pedagogical competence influences 0.295 or 29% on the quality of learning. Tsabitah & Fitria (2021) published the results of his research that teacher professional competence has a 49% influence on the quality of learning. Two previous studies strengthen the research conducted by the researcher and, at the same time, state that the results of this study are different (Mahat, 2024).

The first difference is that the current research uses an instrument with a high-reliability index. Widiharso & Mardapi (2010) state that the reliability value is strong evidence to reduce errors in the measurement process. The higher the reliability value, the lower the measurement error. Of course, it can be concluded that the measurement of teacher competence carried out has a very high level of trust so the measurement of teacher competence represents the actual ability.

The second difference is that from previous research studies, teacher competence is measured by separating four main aspects: pedagogical, process, personality and social competence. All aspects measured in the study will certainly provide a greater effect than the dependent variable. In line with the research conducted by Maulidya & Ulfah (2023) research on teacher competence has an influence of 40.01% on the quality of learning. It's just that the 4 aspects of teacher competence are not explicitly described in the research results.

The current research has conducted a comprehensive study of 4 teacher competencies that have not been in previous studies. In addition, this study also includes complete evidence of the use of appropriate instruments. Researchers obtained evidence that teacher competency has a very large impact, reaching 90% (Kalim, 2024). This is very strong evidence that the quality of learning is the impact of implementing learning that is interrelated with teacher competency. If the teacher is not competent, it is impossible to realize quality learning.

The p-value in the Overall Model Test column is used to test the significance of the regression line equation. The p-value <0.05 indicates that the regression line is significant or can be used well to estimate learning quality variables based on teacher competency. These results indicate a fit line equation in the regression model (Nurdin & Islamiyati, 2014).

In linear regression model analysis table 5, if all the assumptions of the classical linear regression model are met except for the belief of homoscedasticity, which means the presence of heteroscedasticity, then the estimator of the parameters obtained is still unbiased and consistent (Ghozali, 2011). Still, the estimator could be more efficient for small and large samples. Because it fulfills the prerequisite test for linearity, we can know the coefficients a and b for the regression line equation Y = a + bX --> Y = 0.0108 + 0.1187X. Coefficients a and b are seen from the Estimate column.

D. Conclusion

Based on research data that has been tested, it can be concluded that regression analysis using a line equation is reliable for estimating data (F(1,91)= 901, p value<0.001). The analysis results also show a strong influence between the teacher competency variable (X) and the learning quality variable (Y), which is depicted in the form of a regression line equation Y=0.0108 + 0.1187X. The contribution value of the teacher competency variable (X) was 90.8%, while the remaining 9.2% was contributed by other variables that were not researched or outside the scope of the research.

The results of this study provide strong evidence that instruments with high reliability will be able to represent accurate data according to teacher competency conditions. The test results align with the theory that teacher competency has a positive effect and has a very large impact on the quality of learning. In order to

improve the quality of learning, stakeholders must have an agenda to improve teacher competency systematically. Not only that, but the role of teachers in continuing to be motivated to improve competency must always be maintained both through training facilities and independently. It is very important for the realization of good learning quality.

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