

The Impact of Teacher Certification, Academic Supervision, and Teaching Facilities on Improving the Quality of Education with Learning Quality as an Intervening Variable in Vocational Schools around Grobogan Regency

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ABSTRACT

Improving the quality of education is important that the human resources produced are of good quality. However, the quality of education in Indonesia needs attention because it can be seen from the large number of unemployed, dominated by vocational school graduates, namely 10.38%. Conditions that were not much different were also seen in Grobogan Regency, where the number of A-accredited vocational schools only reached 13.79%, meaning that the quality of education in this area needs to be improved. This research aimed to reveal the impact of teacher certification, academic supervision, and teaching infrastructure on the quality of education toward the quality of learning in vocational schools around Grobogan Regency. A total of 93 vocational school teachers were selected as research samples based on Slovin's calculations. Data obtained from filling out questionnaires by respondents were analyzed using path analysis and Sobel test. The research results showed that there was a direct impact of teacher certification, academic supervision, and teaching infrastructure on the quality of learning. Not much different, teacher certification, academic supervision, infrastructure, and quality of learning also have a direct impact on the quality of education. Based on the Sobel test calculations, there was an indirect impact of teacher certification, academic supervision, and teaching

infrastructure on the quality of education toward the quality of learning. The implication was that improving the quality of education can be done by increasing the quantity and quality of teacher certification, implementing optimal supervision by school principals, and providing adequate infrastructure then it can support a quality learning process.

Keywords: Quality of Education, Quality of Learning, Academic Supervision, Teacher Certification.

INTRODUCTION

The quality of education plays an important role in regional and economic development because the quality of education affects the quality of human resources so that it requires special attention for its development. Expanding students' knowledge structures and experiences cannot be separated from the important role of good quality education. Both the quantity and quality of education are key factors in increasing human resources and will have an impact on economic growth (Deme & Mahmoud, 2020). Therefore, efforts to improve the quality of education are important to do by considering various aspects that may be determining factors for success.

The quality of education in Indonesia requires special attention because the quality of graduates is not reaching expectations. Judging from the human resources index (HCI), Indonesia is ranked 87th out of 157 countries with a human resources index value of 0.53 (CNBC, 2020). On the other hand, based on data from the Central Statistics Agency, the number of rakes in Indonesia is still quite high, dominated by Vocational High School graduates with a percentage of 10.38%. This shows that the graduates produced are not yet able to meet the needs of the world of work. So it is necessary to address the quality of the education provided. The quality of education in a smaller scope, one of which is in Grobogan Regency, also shows conditions that are not much different. Based on the number of accredited schools, only 13.79% of schools are accredited A or only 8 schools out of 58 existing schools. This condition shows that the quality of education in Grobogan Regency is not optimal and requires special attention. Because the quality of school accreditation can be used as a parameter for the quality or quality of education that takes place in that place (Awaludin, 2017).

Furthermore, the quality of learning is one of the determining factors that impacts the quality of education Wiyono et al. (2020). Quality education and the quality of learning really depend on the quality of resources and dedication of educators (Fomunyan, 2018). Teacher professionalism in carrying out their profession is a necessity as an effort to improve the quality of education (Syam & Santaria, 2020). Government efforts to improve the quality and professionalism of teachers as well as the quality of education are carried out toward certification programs (Hartoyo et al., 2018). Teacher certification is one of the factors that can contribute to improving the quality of educators (Hooper, 2018) because in the teacher certification process, they are provided with the competencies they need as educators (Ismayani & Permana, 2018).

Therefore, teacher participation in certification is an important effort to support educational improvement. However, conditions in Grobogan show that certified teachers are still in the low category, namely only 35.5%.

Beside from the quality of educators, the continuity of learning is also determined by the school principal as manager and supervisor. Academic supervision is an important factor in supporting the quality of educators in the teaching process and classroom management (Noor et al., 2020). Academic supervision is an effort to help teachers in schools develop their abilities to achieve learning goals (Satyawati et al., 2017). Apart from the educational side, infrastructure is also an important aspect that must be considered. Adequate infrastructure to facilitate the teaching and learning process is an important factor in the effectiveness of the learning process (Yakub et al., 2019). The availability of school facilities and infrastructure is an important key to improving educational outcomes (Swaminathan et al., 2020). Thus, teaching infrastructure is important because it facilitates teachers in developing the learning process at school.

Research by teachers Dey & Bandyopadhyay (2019); Hooper (2018); Wijaya et al., (2021) have revealed that certification is a means of improving the quality of educators. Other research regarding academic supervision which is a determining factor in the success of the educational process has also been conducted by Auliah et al., (2022); Ngulya (2019); Allen et al., (2020) The existence of infrastructure as one aspect of supporting the implementation of quality learning has been studied by Lawrent (2020); De Azevedo Vieira et al., (2020); Shirrell et al., (2019). However, there has been no research that discussed the impact of teacher certification, academic supervision, and teaching infrastructure on the quality of education in vocational schools toward the quality of learning. This research is important to carry out because improving

the quality of education needs to be carried out, so it is necessary to study what aspects impact it so that it will make it easier to determine strategies as an effort to improve and increase the quality of education.

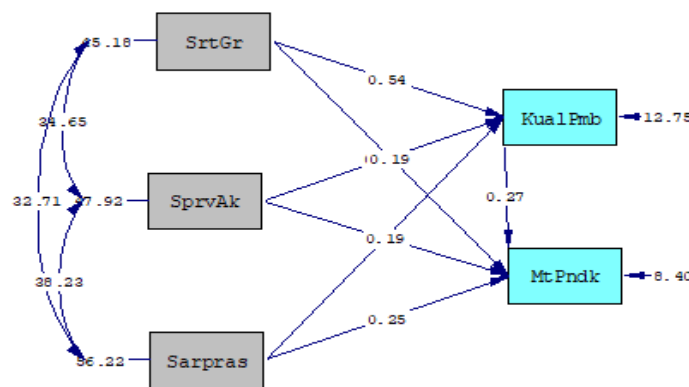
MATERIALS & METHODS

Quantitative research with a correlational research design was chosen in this study. The research process begins with identifying the research problem and determining the problem formulation, then continues with preparing a theoretical study and preparing instruments. The next step is that the instrument is distributed to research respondents using a Google form. The data obtained was tabulated and then analyzed using statistical calculations. The final step is to interpret the calculation results and determine research conclusions. The research population included 11,266 Vocational High School teachers in Grobogan Regency, Central Java. After carrying out calculations using the Slovin formula, 93 samples were obtained which were selected using the proportionate

stratified random sampling technique where the proportion was adjusted to the number of teachers in each school based on accreditation. A questionnaire with a Likert scale of 1 to 4 was developed based on indicators that can measure the variables of teacher certification, academic supervision, infrastructure, quality of learning and quality of education. Research data was analyzed using path analysis and Sobel test to determine the direct and indirect impact of independent variables (teacher certification, academic supervision, teaching infrastructure) on the dependent variable (quality of education) toward intervening variables (quality of learning). Path analysis calculations in research use the Lisrel application and the Sobel test uses the Sobel calculator.

RESULT & DISCUSSION

The way analysis calculations in this research were first carried out by creating a path model in the Lisrel application. The path model formed can see in the following image.



Picture 1 Path Mode

The path model seen in picture 1 showed a positive relationship pattern between the independent variables which include teacher certification, academic certification, and infrastructure with the dependent variable, that is the quality of education, as well as the intervening variable in the form of

learning quality. This can be seen from the path coefficient which is positive. The results of the path analysis test, apart from gaining the path coefficient value, also reveal the Standard Error, statistical T value and r square. The results of these calculations can see in the following table:

Table 1 Path Diagram Calculation Results

Direct Impact	Coefficient Path	Error Standard	T Value	R square
Teacher certification on learning quality	0,54	0,086	6,29	0,75
Academic supervision of the quality of learning	0,24	0,095	2,56	
Infrastructure for the quality of learning	0,21	0,077	2,73	
Teacher certification on the quality of education	0,19	0,084	2,26	0,80
Academic supervision of the quality of education	0,19	0,080	2,43	
Infrastructure toward quality of education	0,25	0,065	3,84	
The quality of learning toward quality of education	0,27	0,086	3,09	

Whether or not there is an impact of each independent variable on the dependent variable can be seen from the T value, where the t value > 1.96 means there is an impact between the two. The R-square value determines how much impact the dependent variable can explain by the independent variable under study. Based on table 1, the coefficient of determination of the impact of teacher certification, academic supervision, and learning infrastructure on learning quality shows a value of 0.75. This mean that the quality of learning is impacted by teacher certification, academic supervision, and infrastructure by 0.75 or 75%, where the remaining 25% is impacted by other variables outside research. Meanwhile, the magnitude of the impact of learning quality, teacher certification, academic supervision, and infrastructure on the quality of education together based on table 1 is 0.80 or 80%.

a) Direct Impact

The impact of teacher certification on the quality of learning in vocational schools around Grobogan Regency

Based on table 1, the t statistical value of the impact of teacher certification on learning quality is $6.29 > 1.96$. This shows that there is a direct impact between teacher certification on the quality of learning in vocational schools in Grobogan Regency. The path coefficient of 0.54 shows a positive value, so the impact given is positive.

The impact of academic supervision on the quality of learning in vocational schools around Grobogan Regency

The results of path analysis calculations based on table 4.2 show that the statistical t value for the effect of academic supervision

on learning quality is $2.56 > 1.96$. A statistical t value greater than 1.96 indicates that there was a direct impact of academic supervision on the quality of learning. The path coefficient for the impact of academic supervision on the quality of learning is 0.24, meaning that the impact given is positive.

The impact of teaching infrastructure on the quality of learning in vocational schools around Grobogan Regency

Table 1 shows the statistical t value of the impact of infrastructure on learning quality of $2.73 > 1.96$. This value shows the impact of infrastructure on the quality of learning in vocational schools around Grobogan Regency with a path coefficient of 0.21. Then, the impact of the infrastructure variable on the quality of learning has a positive relationship way.

The impact of teacher certification on improving the quality of education in vocational schools around Grobogan Regency

The t-statistic value of the effect of teacher certification on the quality of education in table 1 shows a value of $2.26 > 1.96$. This showed the impact of teacher certification variables on the quality of education in vocational schools around Grobogan Regency. The path coefficient for the impact of teacher certification on education quality is 0.19, meaning that the pattern of relationship between teacher certification variables and education quality was positive.

The impact of academic supervision on improving the quality of education in vocational schools around Grobogan Regency

The statistical t value based on table 1 showed the number $2.43 > 1.96$, there was an impact between academic supervision variables on the quality of education in vocational schools around Grobogan Regency. The path coefficient based on table 1 is known to be 0.19, which indicates that the relationship pattern formed between the two variables was a positive relationship.

The impact of teaching infrastructure on improving the quality of education in vocational schools around Grobogan Regency

Table 1 shows that the t-statistic value of the impact of teaching infrastructure on the quality of education was $3.84 > 1.96$, meant that there was an impact of teaching infrastructure on the quality of education in vocational schools around Grobogan Regency. The path coefficient value of the impact of facilities was 0.25, this positive value shows the positive impact of teaching and infrastructure on the quality of

education in vocational schools around Grobogan Regency.

The impact of learning quality on improving the quality of education in vocational schools around Grobogan Regency

Based on table 1, it showed that the t-statistic value was $3.09 > 1.96$, because the t-statistic value is > 1.96 there was an impact of the quality of learning on the quality of education in vocational schools around Grobogan Regency. The path coefficient of 0.27 showed that the relationship pattern formed between the learning quality variables and the quality of education is a positive pattern.

b) Indirect Impact

The indirect impact of teacher certification, academic supervision, and teaching infrastructure on the quality of education toward the quality of learning is calculated using the Sobel test using the Sobel calculator. The calculation results are presented in the following table:

Table 2 Indirect Impact

Indirect Impact	Statistic score with Sobel test
Teacher certification on the quality of education toward the quality of learning	2.808
Academic supervision of the quality of education toward the quality of learning	1.968
Infrastructure on the quality of education toward the quality of learning	2.058

The impact of teacher certification on improving the quality of education toward the quality of learning in vocational schools around Grobogan Regency

The statistical t value in the Sobel test shown in table 1 is $2.808 > 1.96$, there was an indirect impact between teacher certification on the quality of education toward the quality of learning as an intervening variable.

Indirect Impact of academic supervision on improving the quality of education toward the quality of learning in vocational schools around Grobogan Regency

The statistical test value based on table 1 was $1.968 > 1.96$, meant that there was an

indirect impact between academic supervision on the quality of education toward the quality of learning in vocational schools around Grobogan Regency.

The impact of teaching infrastructure on improving the quality of education toward the quality of learning in vocational schools around Grobogan Regency

The Sobel output in table 1 showed a statistical t value of $2.058 > 1.96$, meant that there was an indirect impact of teaching and infrastructure on the quality of education toward the quality of learning in vocational schools around Grobogan Regency.

Discussions regarding teacher certification have been carried out in several studies. Research by Falk (2022) conveyed that

teacher certification supports building a better teaching profession that has the knowledge and skills needed to teach. Conditions in the field show that teachers in Grobogan Regency who are certified have the skills to prepare learning implementation plans according to their field of study, use various media in learning, and are disciplined in their work. Teachers in Grobogan Regency were also able to determine active learning strategies that suit students' needs. The conditions showed conformity with Falk's theory (2022). Gilmour (2020) revealed that certified teachers are equipped with expertise in teaching competencies so they can build a quality learning process. Findings based on hypothesis testing show that teacher certification impacts the quality of learning. The relevance can be seen from the results of this research with the theory expressed by Gilmour (2020). One of the most important strategies for improving the quality of education in a country is to improve the quality of teachers (Harjanto et al., 2018), where teacher quality can be improved toward competency development programs, one of which is teacher certification (Kusumawardhani, 2017). The calculations of this research path analysis also showed the impact of teacher certification on the quality of education in vocational schools around Grobogan Regency. This is aligned with the theory expressed by Harjanto et al., (2018) & Kusumawardhani, (2017). In fact, findings based on hypothesis testing show that teacher certification indirectly impacts the quality of education toward the quality of learning. The existing findings are in line with Khaeruddin et al., (2021) where teacher certification supports teachers' professional competence and is able to implement it well so that it has a good impact and supports long-term impacts on the professional development of prospective teachers and improving the overall quality of education.

Beside from the teacher certification aspect, the support of the school principal also plays a role in supporting quality learning.

Several studies have revealed academic supervision by school principals. Research by Ningsih et al., (2020) revealed that school principals in carrying out academic supervision can provide guidance to teachers in preparing syllabi, learning plans, determining appropriate learning methods and media, and sending teachers to participate in skills development training in teaching. Findings in the field show that the principal of the Grobogan Regency Vocational School conducted a review of the class, asked teachers to take part in training/workshops, and held discussions with teachers regarding the problems faced in the teaching process. The conditions encountered were in accordance with the theory expressed by Ningsih et al., (2020). In fact, based on testing using path analysis, it is known that there is an impact of academic supervision on the quality of learning. This is in line with research by Wasilah (2018) & Hadi (2016) where supervision carried out by the school principal has a positive impact on the quality of the learning process, where there is an increase in the quality of teacher teaching after implementing academic supervision.

Research by Marwati et al., (2019) revealed in the finding that supervision carried out by school principals has a positive impact on the quality of education through its role in encouraging teacher performance to be able to carry out their duties and responsibilities well. In line with the findings of this research, the results of path analysis calculations show that there is a direct impact of academic supervision on the quality of education. In fact, based on Sobel's calculations, an indirect impact can be seen from academic supervision on the quality of education through the quality of learning. The existing findings are in line with Yang et al., (2021) & Nasution et al., (2023) which revealed that school principals in carrying out academic supervision act as collaborative learning facilitators in order to improve the learning process to suit the

needs of students, which in the end will affect learning outcomes

The quality of learning and the quality of education cannot be separated from the existence of adequate infrastructure to support the learning process. The availability of sufficient classrooms, laboratories and learning support equipment in good condition will impact the implementation of an effective learning process (Efendi et al., 2019). To support the learning process, vocational schools in Grobogan Regency have sufficient classrooms, laboratories, libraries and fields to support the learning process. Apart from that, the condition of the classrooms is also clean and tidy, with sufficient availability of books, computers and learning media. The conditions seen have shown that the findings in the field are in line with the theory of S. Efendi et al., (2019). Other research by Koridin & Pujiyati (2019) showed that the management of teaching infrastructure has a significant impact on the quality of the learning process. The results of this research data analysis also showed that teaching infrastructure has a direct impact on the quality of learning in vocational schools throughout Grobogan Regency. Look at the research findings, there was relevance to the research of Koridin & Pujiyati (2019). Well-maintained infrastructure and a comfortable school situation have a positive and significant impact on the quality of education (Nurhayati, 2019). In line with other findings from this research, the results of path analysis calculations succeeded in revealing the impact of teaching infrastructure on improving the quality of education. Furthermore, teaching infrastructure also has an indirect impact on the quality of education through the quality of learning based on Sobel test calculations. This has relevance to Fathurrochman et al., (2021) who stated that the provision of educational facilities and infrastructure is an important aspect that impacts the quality of learning, this is because the availability of adequate facilities and infrastructure will

create an effective and efficient learning process.

A study on the quality of learning was carried out by Sanfo & Malgoubri (2023) stated that the quality of learning can be seen from several dimensions, there are teacher support in the learning process, classroom management and cognitive development. The quality of the material, the quality of the teacher (empathy, responsiveness and reliability) has a significant impact on the quality of learning (Theresiawati et al., 2020). The condition of vocational schools in Grobogan Regency showed that teachers and students carry out a discussion process during learning. The learning process also is carried out by providing projects and dividing into groups. Teachers provide opportunities for students to ask questions, provide appreciation and provide feedback in the learning process then students were enthusiastic about the learning being carried out. The conditions encountered show conformity with the theory of Sanfo & Malgoubri (2023) & Theresiawati et al., (2020). In fact, based on the results of testing using path analysis, the quality of learning has an impact on the quality of education in vocational schools throughout Grobogan Regency. These findings were relevant to Halawa & Mulyanti (2021) where factors that impact the quality of education include the way learning material is presented, the relationship between teachers and students, the use of learning tools, curriculum, monitoring student progress, and giving prizes or incentives.

CONCLUSION

This research succeeded in revealing the direct impact of teacher certification on the quality of learning and the quality of education. On the other hand, teacher certification also has an indirect impact on the quality of education through the quality of learning. Certified teachers are equipped with more skills as educators so they are expected to be able to build a quality learning process which will ultimately

improve the quality of education. The quality of learning and the quality of education are also impacted by direct academic supervision. Even indirectly, academic supervision has a positive impact on the quality of education through the quality of learning. In carrying out supervision, the principal provided assistance and support to teachers to solve learning problems then that quality learning can be developed and the quality of education can be improved. This research also produces findings that teaching infrastructure impacts the quality of learning and the quality of education. Indirectly, infrastructure also impacts the quality of education through the quality of learning. Infrastructure is needed to support the learning process so that learning will run optimally.

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