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Analysis of Teaching Quality Factors at Aviation Vocational Education

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ABSTRACT

Objective: The decreasing absorption capacity of vocational education graduates indicates barriers to teaching quality. This Research aims to analyze the factors that influence the quality of vocational learning. **Method:** This Research uses quantitative methods. The sample is aircraft maintenance engineering students at Aviation Polytechnic. Data analysis uses theStructural Equation Model-Partial Least Square. **Result:** Validation of the research instrument resulted in the loading factor, AVE, Cronbach Alfa, and SRMR meeting the requirements, so the instrument and variables were declared valid and reliable, and the model was declared fit. Lecturer behavior and the quality of learning and learning resources have a direct and significant positive relationship. Meanwhile, management support through learning resources has influenced the quality of learning by 51.0%. **Novelty:** The quality of learning in vocational education is influenced by the role of lecturer behavior and management support in providing and managing quality learning resources. The collaboration of those three aspects can improve the quality of competency of vocational education graduates. The high competency of aviation vocational education graduates can increase the absorption capacity of graduates in the era of Revolution 4.0.

INTRODUCTION

Vocational education is an educational program that prepares graduates to have specific skills to enter the job market. Therefore, vocational education aims to be able to create relevance to industry, create job mobility, provide an understanding of global challenges, provide technological skills to adapt to the latest technological developments in a sustainable manner, and develop soft skill competencies to work in cross-cultural teams in a global environment (Surekha et al., 2020). Thus, vocational education can significantly contribute to developing human resources ready to compete and adapt to the dynamics of the global era (Li & Pilz, 2023; McGrath et al., 2020; Suharno et al., 2020). Aircraft engineering education is one type of vocational education in aviation skills. The success of aircraft maintenance training institutions depends on continuous quality improvement. A sustainable process aims to understand and improve the quality of future teaching and learning (Forbes et al., 2023). Value the lecturer's ability to motivate and engage students in learning (Valantinaite & Navickiene, 2024). This involves establishing appropriate criteria and high standards for the quality of teaching in aviation vocational colleges.

Every college that functions as training in the aviation sector must meet the certification requirements and Training Procedure Manual (TPM) issued by the Civil Aviation Safety Regulations (CASR). The vocational education process is education that emphasizes the development of skills, abilities, attitudes, work habits, understanding, and appreciation that workers need to enter the world of work and make changes or meaningful progress (Augusto et al., 2022; Oviawe & Uwameiye, 2020; Rafiq et al., 2023;

Tushar & Sooraksa, 2023; Uyuni & Adnan, 2020). Information, technology, and communication development in the global era impacts all aspects of vocational education. This condition demands that the quality of vocational teaching be based on technological development conditions. The era of technological revolution demands that vocational education must be able to change mindsets in the learning process.

The quality of learning is a guarantee for the future. The quality of learning is a trigger for improving academic performance. However, adequate effectiveness is also needed to influence academic performance. Total quality management is a strategy to increase the effectiveness of managing vocational schools (Khurniawan et al., 2021). According to Ifechukwu (2020), Core elements that can facilitate quality education in the 21st century include quality of teaching, quality of learning resources, quality of the learning environment, effective school management, quality of learning, and funding. This shows that the quality of teaching is a significant factor in producing graduate competency. Teaching quality is a condition that can create students who are ready and active in learning (Bokayev et al., 2021; Firmansyah et al., 2021; Mathivanan et al., 2021; Rasmitadila et al., 2021; Setyaningsih & Suchyadi, 2021). The quality of teaching at vocational education institutions can positively contribute to graduates entering the world of work. There are seven dynamic digital capabilities that individuals and organizations must have to transform into a virtual environment. Low-quality teaching can result in graduates needing more preparation to face industry demands and the job market.

Based on the data obtained from the Air Transportation Human Resources Development Center (ATHRD), absorption graduates of aviation education in Indonesia 2015-2020 have experienced a decline with an average of 27.600% per year. One of the factors that cause this is quality teaching. Achievement effectiveness education is vocational if formation competence held in form teaching appropriate condition in place work that later becomes his profession. This learning principle was called learning by doing and hands-on experience. Learning is a complex system whose success can be seen from two aspects: product and process. Learning is an interaction process of lecture, student, and resource learning in a learning environment. Quality learning is encouraging circumstances students to actively learn and retain the condition that is always there in the circumstances ready to receive lessons (Mishra et al., 2020; Nartiningrum & Nugroho, 2020; Selvaraj et al., 2021; Sumer et al., 2021; Wang et al., 2021). Quality learning is how much information is presented at an ample rate so students can quickly learn (Slavin, 1994). Therefore, this quality learning is related to systemic with over-component learning that includes educators, participants' education, curriculum, teaching materials, media, and facilities. Teaching aims to form competent, creative, and empowered individuals who are competitive in life. Components are related to each other and mutually strengthen to create an environment where people learn qualified and relevant vocational skills with the demands of the world of work. Therefore, analyzing the factors influencing quality teaching is necessary because achievement results are based on activity teaching.

The curriculum, lecturers, students, teaching, and environment influence learning-teaching. Several factors affecting quality teaching are behavior lecturing, resource learning, and support management. Positive lecturer behavior can improve academic performance (Padhi, 2021). Behavior lecturer vocational covers personal, professional, and environmental aspects. The development of mastering the characteristic learner indicates the positive influence of pedagogical competence, leadership, and work

motivation on professionalism (Sahrazad et al., 2022). Educator moral commitment is a mediator variable that reveals the relationship between team learning and educator career commitment (Atmaca, 2022). Effective leadership in vocational education can support the learning and development of participant students who follow technical training. School management support influences teacher performance (Erturk, 2022). Support management education plays a vital role in the success of educational programs (Löfgren et al., 2023). Support management involves determining lecturer quality, providing source learning and technology, and creating a positive learning environment.

Vocational education management must choose which skills to use to produce high graduate competency. So that the accuracy of skill selection carried out by management can be prioritized by students when investing (Fleming et al., 2023). Therefore, the management of educational institutions needs to examine lecturers' prosocial behavior. Implementation of prosocial behavior to achieve a more cooperative, supportive attitude and a thriving work environment (Hart, 2024). Intense and focused vocational education management support can create an optimal learning environment, guarantee program relevance, and increase graduates' chances of success in the world of work. The problem-solving skills students possess are influenced by technology, teamwork, and self-management. Problem-solving abilities influence work readiness (Susanti et al., 2024). Behavior lecturers' positive and oriented vocational students can impact experience study students and readiness for entering the world of work. Therefore, coaching lecturers in a sustainable way can ensure quality and optimal teaching.

Vocational lecturers must have characters who can encourage students' attitudes, learning intentions, and self-efficacy as professional educators. There is improvement in learning behavior by increasing students' abilities, while the intention is to study behavior so that they can obtain good learning results (Li et al., 2024). With the digitalization of learning resources, lecturers must be able to adapt to these technological developments. The direct relationship between digital literacy and an innovative mindset correlates with interpersonal communication and educator performance (Dewanto et al., 2024). Vocational education learning resources include materials, media, learning equipment, and learning methods. Aviation competency can only be formed by integrating these learning resources. Learning resources are essential in creating a holistic and integrated learning ecosystem in vocational education (Shamzzuzoha et al., 2022). Therefore, existing educational resources can be reused to develop thinking on a complex open platform. Adaptation, reuse, and redistribution of Open Educational Resources (OER) can contribute significantly to developing complex thinking skills and aligning educational practices with the demands of the 21st century (Sanabira et al., 2023).

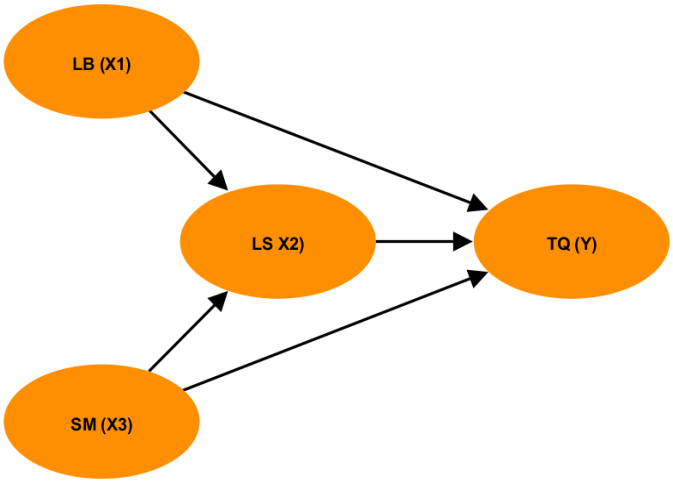
Based on the background above, the novelties that need to be studied are integrating lecturer behavior, learning resources, and management support in vocational education. Correlation behavior between lecturer and resource learning is related to mutual things and crucial for quality teaching education. The harmony between these factors aims to create a conducive learning environment, increase student motivation, and increase the effectiveness of comprehensive vocational learning to produce high graduate competency. The collaboration of those three aspects can improve the quality of competency of vocational education graduates. The high competency of aviation vocational education graduates can increase the absorption capacity of graduates in the era of Revolution 4.0. This condition will show vocational higher education's

readiness and ability to face global change. The adaptability and validity of higher education institutions in Indonesia have perfect internal consistency (Erliyani et al., 2024).

RESEARCH METHOD

This research method used a survey method with quantitative data analysis. A quantitative study is used to sample from a population-specific nature representative, with data collection techniques using instrument research (Sugiono, 2013). This Instrument research used a scale of four points. Instrument validation uses CVR, Item Total Correlation, and Item Fit, and reliability tests use reliability composite Cronbach Alpha. Research data collection using questionnaires given to students as respondents. The determination technique of sample research uses a purposive sampling technique. Population research is 480 students of aircraft maintenance technic-Aviation Polytechnic in Indonesia. Procedure research follows 1) identification of the problem; 2) theoretical review; create research instruments; 3) test the validity and reliability of the instrument; 4) data collection; 5) data analysis; 6) discussion; 7) conclusion.

This research data analysis uses the Structural Equation Model (SEM). Stages analysis research includes two stages: model measurement and structural equation. The measurement model aims to assess the validity and reliability of the variables in the model, and Structural equation analysis aims to determine the relationship between research variables. The measurement model determines the connection between observed constructs and indicators (Al-Qudah et al., 2022; Hanafiah, 2020; Purwanto & Sudargini, 2021; Rhemtulla et al., 2020; Sarstedt et al., 2022). Where the equation structural model determines the connection between the construct, researchers can draw a conceptual model based on that background, as in Figure 1.



Note: X1: Lecturer Behavior; X2: Source Study; X3: Support Management; Y: Quality Teaching

Figure 1. The conceptual model connects lecturer behavior, resource learning, and support management with quality teaching.

According to a conceptual model in Figure 1, can set hypothesis research that is:
H1: How does the behavior of a lecturer correlate with quality teaching?
H2: How can resource learning be correlated with quality teaching?
H3: How correlation supports management with quality teaching.

H4: How correlation behavior of lecturers through resources learning with quality teaching.
H5: How correlation supports management through resource learning with quality teaching.

RESULTS AND DISCUSSION

Results

The measurement model aims to determine the validity and reliability of the constructed instrument. The validity construct can be seen as validity convergent and validity discriminant. Validity convergent is level correlation positive, a collection of items that reflect the construct. The study explorative's convergent validity loading factor value is more significant than 0.700, and the Average Variance Extracted (AVE) value is more significant than 0.500 (Ghozali et al., 2015). The validation results of the convergent study are shown in Table 1.

Table 1. Validity value convergent.

Variable	Items	Original Sample	p-value
Behavior (X1)	X1	0.791	0.000
	X2	0.926	
	X4	0.780	
	X5	0.843	
	X7	0.823	
	X8	0.808	
Source Learning (X2)	X9	0.839	
	X10	0.843	
	X11	0.808	
	X12	0.840	
Support Management (X3)	X14	0.863	
	X15	0.906	
	X16	0.790	
Quality Teaching (Y)	Y1	0.793	
	Y2	0.766	
	Y3	0.898	
	Y4	0.894	
	Y5	0.766	
	Y6	0.766	

Based on results validation convergent on Table 1, all instrument items variables X1, X2, X3, and Y get loading factor values greater than 0.700. that value showing all instrument items can declared valid. The square loading factor value gives how much ample variant construct information describes the item. The average of all square loading factor values produces the Average Variance Extracted (AVE) value. AVE shows a commonality (COM) value construct. Results AVE value for every variable is shown in Table 2.

Table 2. Average Variance Extracted (AVE) values.

Variable	AVE
Lecturer Behavior (X1)	0.708
Source Learning (X2)	0.683
Support Management (X3)	0.730
Quality Learning (Y)	0.666

The AVE results in Table 2 show that all variables have an AVE value greater than 0.500. This value correlates well with variable lecturer behavior, resource learning, support management, and quality teaching.

Validity discriminant aims to show a level correlation between the AVE of one variable and the AVE of another variable. It is determined by value cross-loading. If the AVE value of every variable is greater than the square correlation of two variables, the variables have validity discriminant. The result of the validity discriminant test is shown in Table 3.

Table 3. Validity test results are discriminant.

Indicator	Lecturer Behavior (X1)	Source Study (X2)	Support Management (X3)	Quality Teaching (Y)
X1	0.791	0.544	0.514	0.680
X2	0.926	0.722	0.634	0.800
X4	0.799	0.609	0.532	0.573
X5	0.843	0.648	0.592	0.689
X7	0.719	0.821	0.76	0.754
X8	0.671	0.807	0.753	0.768
X9	0.547	0.838	0.621	0.619
X10	0.668	0.842	0.660	0.751
X11	0.487	0.808	0.581	0.670
X12	0.595	0.839	0.694	0.723
X14	0.562	0.729	0.863	0.660
X15	0.564	0.766	0.906	0.710
X16	0.611	0.630	0.789	0.760
Y1	0.672	0.662	0.689	0.792
Y2	0.634	0.602	0.750	0.765
Y3	0.717	0.732	0.765	0.897
Y4	0.698	0.733	0.773	0.894
Y5	0.667	0.674	0.503	0.765
Y6	0.621	0.636	0.546	0.766

Cross-loading values in Table 3 show that any indicators in this variable study have a cross-loading value more significant than the square AVE value. Based on that, results can conclude that indicators used in Research produce good validity discrimination when forming respective variables.

The reliability composite aims to test reliability indicators for every variable. A variable is reliable if the composite reliability value (Cronbach Alpha) is above 0.700. The value of the reliability test results composite is shown in Table 4.

Table 4. Reliability values composite.

Variable	Cronbach Alpha
Lecturer Behavior (X1)	0.861
Source Learning (X2)	0.908
Support Management (X3)	0.898
Quality Teaching (Y)	0.813

Based on the result of the data Cronbach Alpha value in Table 4, the value reliability composite of all variables gets a mark greater than 0.700. Those values, such as variable behavior lectures, resource learning, support management, and quality teaching, are highly reliable. This value can declare that all variables can used to collect research data

more carried on. Thereby, results measurement models that include validation convergent, validate discriminant, analysis AVE, and reliability composite test on this study can declared valid and reliable.

The equation model and structural analysis statistics determine the relationship between two or more variables. Partial Least Square Structural Equation Modeling (PLS-SEM) is a technique of multi-variant analysis that makes it possible to test variables in models. The path coefficient value structurally indicates the result of the equation. This value aim analysis hypothesis study. Coefficient determination (R^2) measure model capabilities explained other variables with endogenous variables (Irfansyah et al., 2023). Classification coefficient correlation: $R^2 > 0.607$: correlation good; $0.330 < R^2 < 0.670$: correlation sufficient and $0.190 < R^2 < 0.330$: correlation weak,. The results of the equation model structural analysis are shown in Figure 2.

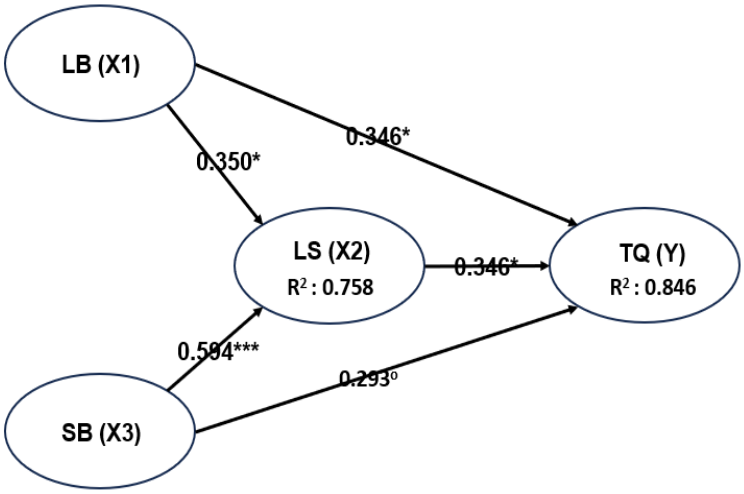


Figure 2. Equation model structural result.

Based on the results of the determination test in Figure 1, it produces a correlation between the behavior of lecturers and support management toward resource learning (R^2:0.758>0.670). That value shows that source learning is influenced by behavior lecturers and support management, amounting to 75.80%. This value can be categorized as good. Therefore, the better behavior of lecturers and support management will enhance the learning of quality resources. Correlation behavior lecturers, support management, and resource learning are geared toward quality teaching (R^2: 0.846>0.670). This correlation value can state that quality teaching influenced behavior lecturers, support management, and resources learning, amounting to 84.600%. Therefore, That is the third factor, so the quality of teaching will be better. This value can conclude that the variable relationship is perfect. This research model produced a value of goodness of model fit described in Standardized Root Mean Square Residual (SRMR): 0.093. This value showing the model still can declared fit. Based on the results, the determination and SRMR values can show that the model fits and that the data is appropriate for the models. Analysis results of structural model equations are shown in Table 5.

Table 5. Coefficient path results.

Effect	Original Coefficient (b)	p-value (2-sided)	Standard Deviation	T-statistic (O/stddev) (t)
Direct Effects				

Effect	Original Coefficient (b)	p-value (2-sided)	Standard Deviation	T-statistic (O/stddev) (t)
Lecturer Behavior→ Source Study	0.350	0.010	0.136	2.570
Quality Lecturer →Behavior Teaching	0.346	0.020	0.149	2.318
Source Study → Quality Teaching	0.366	0.139	0.247	1.480
Support Management → Source Study	0.594	0.000	0.116	5.117
Support Management) → Quality Teaching	0.293	0.051	0.151	1.947
Total Effect				
The Behavior of Resource Lecturers→ Study → Quality Teaching	0.474	0.000	0.097	4.977
Support Management) →Source Study → Quality Teaching	0.510	0.000	0.096	5.294

Discussion

Based on the results, the analysis in Table 5 shows that mark Original Coefficient (b) shows a high level of influence between variables. The significance level hypothesis is guided by a p-value smaller than 0.050 or a T-statistic value (t) greater than 1.96 for two-tailed. According to Prabowo et al. (2021), the hypothesis can be accepted if the T-statistic (t) value is more significant than 1.960. Based on the results of the structural equation analysis in Table 5 produced behavior lecturer to resource learning produce (b:0.350; p:0.010<0.050; t:2.570>1.960). That value showing behavior lecturers significant influences directly resource learning amounts to 35.000%; 1) integration of relevant and up-to-date resources learning in delivery material; 2) building a good relationship between behavior lecturers and successful students in understanding the material; 3) capability integrate good technology learning, improve access and engagement student to resources learning. Therefore, a behavior-active lecturer can convey information, provide a supportive understanding of students' learning resources, give support, and respond to students' questions so that they can increase the involvement of students in resource learning. Therefore, good-behavior lecturers can provide good learning resources that enrich the learning experience and develop an understanding of good skills in vocational education.

Based on the results of the structural equation analysis in Table 5, the Correlation behavior of the lecturer toward quality teaching produces a value equal to (b: 0.346, p: 0.0205<0.005, t: 2.318>1.960). This condition means that behavior lecturers directly influence 34.600% against quality learning. Ability to communicate with the lecturer, involvement high lecturer, use method effective learning and suitability delivery of material capable push ability to understand students, understand students' characteristics to create dynamic interaction in the teaching process. Behavior lecturers through resources learning correlate with quality teaching of b:0.474; p:0.000<0.050; t:4.977>1.960. This correlation shows that behavior lecturers, through resources learning, significantly influence quality teaching directly, amounting to 47.400%. Correlation behavior lecturers and resources learning own impact selection and integration of material learning, use source diverse learning and use technology

learning. All impacts can influence and create quality teaching. Therefore, developing quality teaching involves collaboration between lecturers and students, dynamics class, and developing the latest program study. Vocational education management must choose which skills to use to produce high graduate competency. So that the accuracy of skill selection carried out by management can be prioritized by students when investing (Fleming et al., 2023).

Referring to the above analysis, various lecturers and resource learning elements play critical roles in creating quality teaching in vocational education. According to Noori (2021), students' perception of positive behavior lecturers in the environment study. This matter is that behavior lecturers are reflections of the job description of educators. Behavior lecturers can be seen in learning through performance. Anatomy and work balance have a significant impact on teacher performance. Work autonomy has a relationship to the professional career of educators. So, school management must focus on increasing autonomy and work-life balance to improve lecturer performance. Quality learning is influenced by implementation competence and performance, as shown by actions, behavior, and thoughts. This shows that a qualified lecturer is an indicator of quality teaching in education or college. Qualification lecturers are closely related to competency and level of education, which influences the quality of lecturers. Quality lecturers are an absolute requirement to create a quality education system. Measuring quality teaching becomes very complex because it involves knowledge, experience, and pedagogical skills. Principle learning education vocational more effective done learning by doing and hands-on experience. Therefore, quality teaching education is influenced by collaborative behavior among lecturers with resources learning according to objective learning.

Based on the results of the structural equation analysis in Table 5, produced Support management significantly influenced resource learning directly, amounting to 59.400% (b:0.594; P:0.000<0.050; t:5.117>1.960). This value states that support management institution education greatly influences quality vocational resources learning. Currently, correlation quality teaching is not influenced directly by support management. This condition is proven by the results coefficient path value equal to (b:0.293; p:0.0515>0.050; t:1.9476<1.960). Therefore, quality teaching is significantly influenced by support management through resource learning, which amounted to 51.000%. This condition is proven by correlation value (b:0.510; p:0.0000<0.050; t:5.129>1.960). The vocational education process is education that emphasizes the development of skills, abilities, attitudes, work habits, understanding, and appreciation that workers need to enter the world of work and make changes or meaningful progress (Augusto et al., 2022; Oviawe & Uwameiye, 2020; Rafiq et al., 2023; Tushar & Sooraksa, 2023; Uyuni & Adnan, 2020). Based on the result of the discussion above, quality learning in vocational education requires support management to prepare resources for learning according to objective learning. Resource learning in vocational education must provide practical experience in the field or the actual work environment, giving directed and structured guidance on the learning process and harmony with the development technology. It provides a more comprehensive understanding of the critical factors that influence the quality of teaching, proving the development of effective strategies for improving the teaching of various major disciplines (Yao & Lin, 2023). Resources learning must impact learning quality practice. This condition can affect andragogy competence, adequate organization, updated knowledge, technology competence, and institutional policy. Therefore, to describe how management resources

learning can influence students' performance and abilities, critical thinking is essential in students' management of resources learning.

CONCLUSION

Fundamental Finding: The Research concluded that (1) Lecturer behavior directly influences the quality of teaching; Learning resources directly influence the quality of teaching; Management support directly influences the quality of teaching; (2) Learning resources are directly influenced by lecturer behavior and management support. **Implication:** Lecturer behavior has a vital role in vocational education institutions. So, institutions must understand and support the development of lecturer behavior. Moreover, it ensures the availability and accessibility of quality learning resources by understanding their importance. Management support and learning resources show the need for synergy between management policies and learning resource management strategies. Thus, collaboration and integration of teaching quality factors can improve and create the quality of vocational education. **Limitation:** The subject of this Research is limited to lecturer behavior, management support, and learning resources in aviation vocational education. **Future Research:** A study is needed to determine the relationship between lecturer motive, learning environment, and vocational education learning systems.

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