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# Improving Vocational High School Quality: Link and Match, Teacher Professional Competence, and School Culture

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## ABSTRACT

This study addresses the persistently low absorption of vocational high school graduates in Kendal Regency, Indonesia, despite the region's strategic position within a special economic zone that demands a skilled workforce. The study aims to examine the influence of the link and match program, teachers' professional competence, and vocational school culture on improving the quality of vocational education and its relevance to graduate employability. A quantitative correlational research design was employed, involving 219 vocational teachers selected through proportional random sampling. Data were collected using validated questionnaires and analyzed using multiple regression and correlation techniques. The results reveal that the link and match program significantly contributes to vocational education quality improvement (54.2%), followed by teachers' professional competence (24.4%) and school culture (24.1%). Collectively, these variables explain 76.7% of the variance in vocational education quality. The findings indicate that effective industry–school alignment, continuous professional development of teachers, and the internalization of industrial work culture are critical factors in enhancing graduate readiness and employability. This study contributes to the field of vocational education by providing empirical evidence on an integrated model of quality improvement that supports stronger alignment between vocational schools and labor market demands.

## ARTICLE INFORMATION

***Keywords:***
*link and match; teacher professional competence; school culture; vocational high school quality*

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## INTRODUCTION

Efforts to strengthen the synergy between the education sector and industry continue to be intensified by the government through the Ministry of Primary and Secondary Education (Kemendikdasmen), particularly by the Directorate of Vocational High School. As stated by Setyoko Pramono, Intermediate Industry Advisor at the Human Resources Development Agency for Industry (BPSDMI), during a Vocational High School webinar, strategies to enhance Vocational High School partnerships should be firmly aligned with the real needs of the business and industrial sectors. Furthermore, the reinforcement of Vocational High School must be carried out in an integrated manner and be aligned with current industry demands (Direktorat Sekolah Menengah Kejuruan, Kementerian Pendidikan Dasar dan Menengah Republik Indonesia, 2025). However, in practice, the unemployment rate among Vocational High School graduates remains relatively high. According to data from the Central Statistics Agency (BPS), the open unemployment rate for Vocational High School graduates reached 9.01% in August 2024, which is higher than that of senior high school graduates

(7.05%) (Badan Pusat Statistik, 2024). These figures indicate a serious issue with the absorption of vocational graduates into the labor market, largely due to a mismatch between their competencies and the needs of the business and industrial sectors. Quality education concerns what and how individuals learn, its relevance to current global challenges, and its influence on the choices people make. Zuhri and Mastiani (2024) examined the management of industry-based classes as a vocational quality management strategy to enhance students' occupational competencies and graduate employability. The findings indicate that competency-based learning processes and clearly defined industry job functions improve graduates' work readiness and increase their absorption into the business and industrial sectors.

The quality of education in Indonesia is still relatively low compared to other countries, and many factors contribute to the slow progress of the national education system. Syaifudin et al. (2024) examined the implementation of the Internal Quality Assurance System (SPMI) in two vocational high schools as a strategy to meet workforce demands. The study found that Vocational High School quality improved when schools applied a structured quality assurance cycle and actively collaborated with industry partners. When these factors are connected to Vocational High School at the Vocational High School level, the alignment between the quality of education and the needs of the business and industrial sectors becomes essential. Therefore, Vocational High Schools ideally need to establish a School Quality Assurance Team as a commitment to ensuring the quality of the education they provide. However, in Kendal Regency, particularly at the public Vocational High School, preliminary observations indicate that only three of the seven public Vocational High Schools have an active School Quality Assurance Team. This situation raises concerns among stakeholders, including the community and industry partners, as the quality of vocational graduates is often inconsistent. Ningsih et al. (2024) investigated planning, implementation, and evaluation strategies for improving education quality through partnerships between schools and business and industry (DU/DI) in vocational high schools. The findings indicate that effective partnerships are a significant component in enhancing Vocational High School quality.

According to the book *Link and Match* (1993), there are four main connections between education and rapid development: 1) increasing demands of the workforce that align with developmental needs, both quantitatively and qualitatively; 2) changes in the structure and requirements of the labor market, which has become more competitive and increasingly reliant on specialized expertise without neglecting interdisciplinary knowledge; 3) a general trend in education showing a shift in perspective, emphasizing that education should prepare learners comprehensively in terms of knowledge, attitudes, motivation, and skills; and 4) the growing popularity of the concept of high-quality human resource development. In line with this discussion, Komala (2021) also notes in her research that link and match is strongly supported by factors such as curriculum and material relevance, the implementation of industrial visits, teachers' competencies, classroom standardization, teachers' attitudes, knowledge and skills, teaching practices, and students' competencies related to machinery, as well as their attitudes. Based on these interconnections, the link-and-match program significantly influences the quality of Vocational High Schools today. The relevance of instructional content, the suitability of practical equipment, and the school culture adopted all contribute to the quality of vocational graduates across various skill areas. However, initial observations in Kendal Regency show that only four Vocational High Schools have implemented industrial classes as part of the link-and-match program.

The *link-and-match program is not the only factor influencing educational quality; internal factors, such as teachers' professional competence,* also play a crucial role. Many Vocational High School teachers still lack adequate professionalism due to various factors, including their status as honorary teachers, limited access to training facilities, and insufficient industry experience. In addition, many

high school and Vocational High School teachers are still not fully competent in their fields. This issue should be addressed promptly, considering the essential role teachers play in the education sector (Dina, 2022). Professional certification for vocational high school teachers can strengthen their professional competence, as it plays an important role in preparing graduates who are more aligned with industry standards (Pambayun et al, 2024). This is also consistent with Mulyadi et al. (2017), who emphasize the importance of continuous professional development for vocational teachers to align their competencies with technological advancements and industry needs, thereby enhancing graduates' work-readiness.

Another important factor in improving the quality of education in Vocational High School is the implementation of a school culture that is aligned with industrial culture. According to Deal and Peterson (2015), school culture is a set of values that underlie the behaviors, traditions, daily habits, and symbols practiced by the principal, teachers, administrative staff, students, and the surrounding community. School culture represents the school's unique identity, character, and image within the broader society. School culture encompasses the overall physical setting, environment, atmosphere, tone, character, and climate of the school that productively provides positive experiences for the growth and development of students' intelligence, skills, and activities (Maryamah, 2016). In line with this definition, Vocational High Schools that implement the link-and-match program will naturally adopt the industrial culture of their partner industries as a commitment to producing graduates whose character aligns with real conditions in industry. For example, the 5S culture (seiri, seiton, seiso, seiketsu, and shitsuke), which originated in Japanese industrial work culture, is adopted and adapted to the context of Vocational High School (Direktorat Pembinaan Sekolah Menengah Kejuruan, 2019). Another study systematically explains how the habituation to industrial work culture is integrated into Vocational High School through programs such as the Teaching Factory, industrial internships, the internalization of 5S/5R values, and school–industry collaboration. The findings indicate that a systematically habituated work culture plays a crucial role in producing competent vocational graduates who are ready to compete in the industrial workforce (Rohmatika, 2025).

In several previous studies such as Nursidah (2021) research on the influence of principals academic supervision and school culture on teaching quality, Borotoding (2021) study on the effect of principal leadership on education quality at Vocational High School Kristen Bittuang, and Kartiningsih (2024) research on the influence of teachers professional competence and learning facilities on the education quality at Vocational High School PK BIM Jombang none have specifically addressed the impact of the *link and match* program in Vocational High School on their educational quality. Therefore, research is needed to determine the extent to which the *link-and-match program, teachers' professional competence, and school culture influence improvements in educational quality at a* public Vocational High School in Kendal Regency. The findings of this study are expected to provide policymakers, school principals, and teachers with valuable input for designing sustainable, relevant strategies to improve the quality of Vocational High Schools in line with current demands.

## METHOD

This study employs a quantitative research method, using research instruments to collect data. The collected data will then be analyzed statistically to test the predetermined hypotheses. The quantitative method is a research approach based on the philosophy of positivism, used to investigate a specific population or randomly selected sample, with data collected through research instruments (Sugiyono, 2024). The focus of this study is to reveal the extent to which the *link-and-match* program and school culture management influence the improvement of Vocational High School quality in Kendal Regency. Therefore, to obtain comprehensive, in-depth data and provide complete answers to the research problems, a quantitative research approach is employed. This study is a correlational

associative research design with three independent variables: the *link and match* program (X1), teacher competence (X2), and school culture (X3), and one dependent variable, the improvement of Vocational High School quality (Y).

This research was conducted in seven public Vocational High Schools in Kendal Regency, with a total teacher population of 481. A random sample of 219 teachers was selected using the Slovin formula with a 5% margin of error. The sampling technique used in this study is probability sampling, which provides every member of the population an equal chance of being selected as a sample member. This study uses a questionnaire to collect primary data from respondents. The questionnaire consists of questions related to the research variables. The respondents' answers are assessed using a Likert scale ranging from never (1) to always (5).

**Table 1**. Measured Variables

| Variable | Dimension | Indicator | Number of Questions |
|---|---|---|---|
| Vocational High School quality (Y) | Input | New student admission; sources of educational funding | 8 |
| | Proccess | Curriculum used; teacher competence; educational facilities and infrastructure; school culture | 12 |
| | Output | Student character; graduate employability | 6 |
| | Outcome | Industry school partnership networks | 4 |
| Link and Match ($X_1$) | Industry-standard curriculum | The curriculum is developed collaboratively with industry partners; shared use of practical facilities owned by both the school and industry | 6 |
| | Teacher internship in industry | Vocational High School teachers carry out internships in industries relevant to their areas of expertise; teachers who complete internships gain an understanding of industry needs | 6 |
| | Teaching Factory | Vocational High School produces industry-standard products/services; student involvement in all stages of the production cycle, implementation of industrial work procedure standards | 9 |
| | Graduate absorption in industry | Number of graduates employed, graduates waiting period for employment, and user (industry) satisfaction with graduates | 9 |
| Teachers' professional competence ($X_2$) | Personal competence | Ability to respect and appreciate people of different religions; ability to behave in accordance with norms, rules, and prevailing values; being democratic and open-minded. | 9 |
| | Professional competence | Understanding of educational psychology; ability to master subject matter; ability to apply learning methodologies and strategies; ability to design and utilize various teaching media; ability to develop instructional programs | 15 |

| Variable | Dimension | Indicator | Number of Questions |
|---|---|---|---|
| | Social–community competence | Ability to interact and communicate with colleagues; ability to recognize and understand the functions of various institutions; ability to establish cooperation | 9 |
| School Culture ($X_3$) | Physical | Availability of primary and supporting facilities; a comfortable and safe learning environment | 8 |
| | Social | Interactions among teachers and staff; interactions among students; interactions between students and teachers/staff; cooperation among all school members | 14 |
| | Symbolic | Implementation of the 5R industrial culture (clean, neat, organized, maintained, disciplined); implementation of the 5S culture (smile, greet, salute, polite, courteous) | 8 |

The research instrument was developed based on relevant theories and prior studies on vocational high school quality, the link-and-match program, teacher professional competence, and school culture. Content validity was established through expert judgment involving three senior lecturers in educational management, who reviewed the instrument for clarity, relevance, and alignment with the research variables. Construct validity was examined using corrected item–total correlation analysis. The results indicated that all questionnaire items had correlation coefficients greater than 0.30, indicating that all items were valid and suitable for measuring their respective constructs. Reliability testing was conducted using Cronbach's Alpha coefficient. The results showed that all research variables had Cronbach's Alpha values greater than 0.70, indicating acceptable internal consistency and reliability of the instrument**.**

The research data were collected by distributing questionnaires to teachers in seven Vocational High Schools, who served as respondents and provided answers based on their personal experiences and perceptions. The collected responses were analyzed using SPSS. The data analysis began with descriptive statistics to identify patterns and distributions within each research variable. Subsequently, several classical assumption tests were performed: a normality test to assess whether the data were normally distributed, a linearity test to verify the linear relationship between variables, a multicollinearity test to detect any high correlations among independent variables that could potentially bias the regression results, and a test to evaluate the consistency of residual variance (heteroscedasticity). To examine the simultaneous effects of the *link and match* program ($X_1$), teachers professional competence ($X_2$), and school culture ($X_3$) on the improvement of Vocational High School quality (Y), a multiple linear regression analysis was performed using the model: $Y = a + b_1X_1 + b_2X_2 + b_3X_3 + e$, where *a* is the constant, $b_1$, $b_2$, and $b_3$ are the regression coefficients, and *e* is the error term. Hypothesis testing was carried out using a t-test to determine the partial effect of each independent variable and an F-test to assess their simultaneous influence. Additionally, the coefficient of determination ($R^2$) was calculated to determine the proportion of variance in Vocational High School quality explained by the independent variables. This analytical approach was designed to ensure the validity of the findings regarding the influence of the *link and match* program, teachers' professional competence, and school culture on improving the quality of Vocational High Schools across the seven public Vocational High Schools in Kendal Regency, thereby providing a foundation for strategic recommendations to enhance educational quality.

This study was performed in accordance with ethical principles in educational research. Prior to data collection, all participating teachers were informed of the study's purpose and procedures and asked to provide consent. Participants were assured that their identities would remain confidential, that all information would be kept confidential, and that the data would be used solely for research purposes. Furthermore, the study was carried out in compliance with the ethical approval procedures established by University of PGRI Semarang.

The data on improvements in Vocational High School quality were obtained from the total scores of 30 statement items, which represented the responses of 219 research participants to the instrument. IBM SPSS generated descriptive statistics for the Vocational High School quality improvement variable. Based on data collected on the improvement of Vocational High School quality from 219 respondents, the overall results show a maximum score of 150, a minimum of 115, a mean of 135.25, and a standard deviation of 7.4. The distribution of Vocational High School quality improvement data is classified into five categories: very good, good, fair, poor, and very poor.

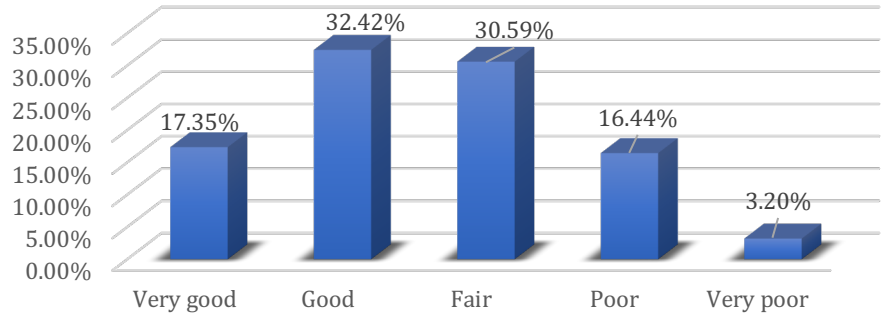



**Figure 1**. Vocational High School Quality Improvement Frequency Distribution

Based on Figure 1, of the 219 respondents, 32.42% have a good perception of Vocational High School quality improvement, and 17.35% have a very good perception. This indicates that improving the quality of public Vocational High Schools in Kendal Regency is relatively effective. However, 3.20% of respondents expressed a perception in the poor category, 16.44% in the less good category, and 30.59% in the fairly good category, which presents a challenge for further development. Other factors, such as teacher quality and the availability of facilities and infrastructure, also contribute to the lower assessment given by some respondents. The data on the link-and-match program were obtained from the total scores of 30 statement items, which represented the responses of 219 research participants to the instrument. The descriptive statistical output for the link-and-match program variable was generated using IBM SPSS. Based on the data collected regarding the link-and-match program from 219 respondents, the overall results show a maximum score of 143, a minimum score of 112, a mean of 128.58, and a standard deviation of 7.24. The distribution of link and match program data is classified into five categories: very good, good, fair, poor, and very poor.

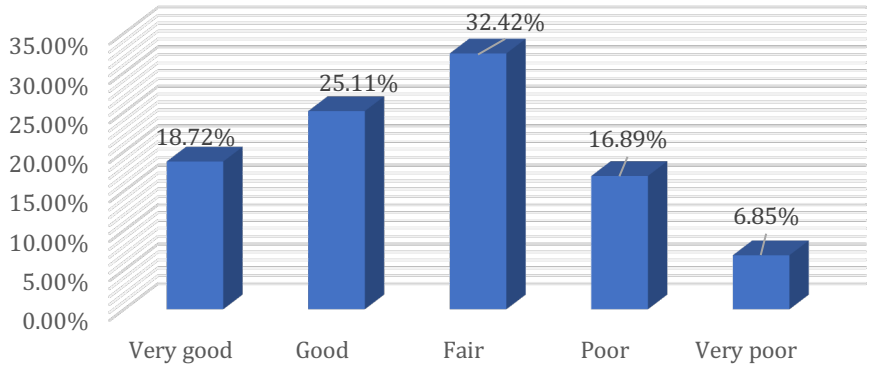



**Figure 2**. Link and Match Program Frequency Distribution

Based on Figure 2, the perceptions of 219 respondents regarding the link-and-match program show that 32.42% have a *fairly good* perception, 25.11% have a *good* perception, and 18.72% have a *very good* perception. This indicates that the link-and-match program has been implemented effectively in most areas of Kendal Regency. However, 6.85% of respondents hold a *poor* perception, and 16.89% report a *less favorable* perception, suggesting that there are still Vocational High Schools that have not yet implemented the link-and-match program optimally. This condition may be attributed to limited understanding or insufficient support from industry partners.

The data on teacher professional competence were obtained from the total scores of 33 statement items, representing the responses of 219 research participants to the instrument. IBM SPSS generated the descriptive statistical output for the teacher professional competence variable. Based on the data collected on teacher professional competence from 219 respondents, the overall results show a maximum score of 165, a minimum score of 141, a mean of 154.58, and a standard deviation of 5.28. The distribution of teacher professional competence data is classified into five categories: very good, good, fair, poor, and very poor.

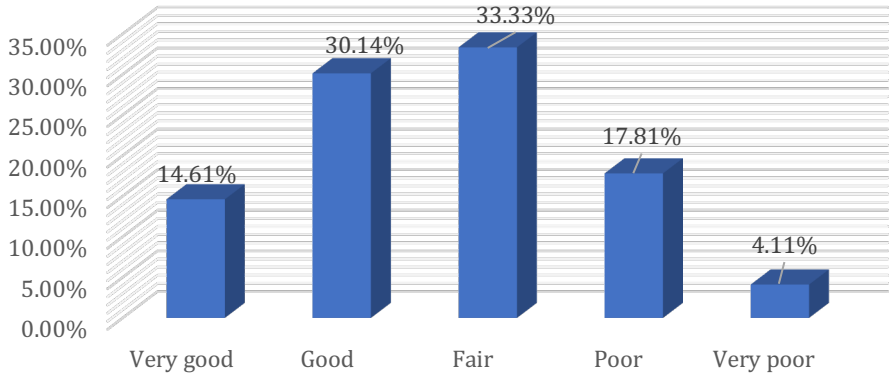



**Figure 3**. Teacher Professional Competence Frequency Distribution

Based on Figure 3, the perceptions of 219 respondents regarding teachers' professional competence indicate that 33.33% of respondents assessed it as *fairly good*, 30.14% as *good*, and 14.61% as *very good*. These results suggest that the overall professional competence of Vocational High School teachers in Kendal Regency is generally adequate. However, 17.81% of respondents rated teachers' professional competence as *less good*, and 4.11% rated it as *poor*, indicating that a proportion of teachers still exhibit suboptimal levels of professional competence.

The data on the school culture of the public Vocational High School in Kendal Regency were obtained from the total scores of 30 statement items, representing the responses of 219 research participants to the school culture instrument. The descriptive statistics for the school culture variable were generated using IBM SPSS. Based on the data collected on School Culture from 219 respondents, the overall results show a maximum score of 150, a minimum score of 125, a mean of 139.38, and a standard deviation of 5.54. The distribution of School Culture data is classified into five categories: very good, good, fair, poor, and very poor.

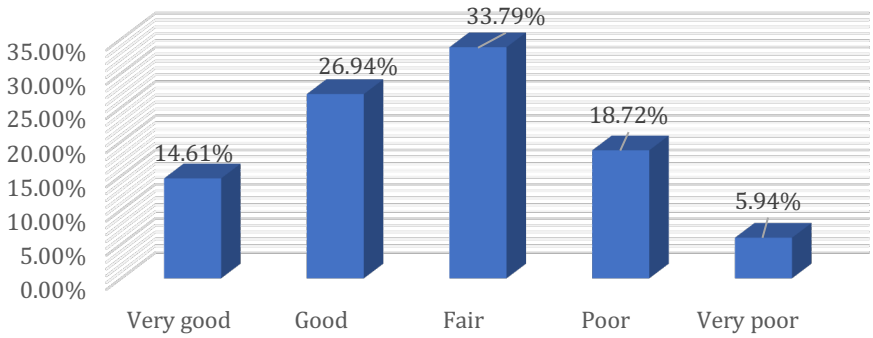



**Figure 4**. School Culture Frequency Distribution

Based on Figure 4, the perceptions of 219 respondents regarding School Culture indicate that 33.79% assessed it as fairly good, 26.94% as *good*, and 14.61% as *very good*. These results suggest that the overall School Culture of Vocational High School in Kendal Regency can be categorized as generally adequate. However, 5,94% of respondents rated School Culture as *very poor*, and 18,72% rated it as *poor*. This indicates that there are still aspects of school culture at the Vocational High School in Kendal Regency that have not yet been fully optimized.

Tests of Classical Regression Assumptions are a set of statistical tests used to ensure that a regression model meets the basic assumptions required for valid and reliable results. These tests assess whether the data are suitable for regression analysis and whether the model's estimates can be trusted. Specifically, these tests include the Normality Test to check whether the residuals are normally distributed, the Linearity Test to ensure that the relationship between the independent and dependent variables is linear, the Multicollinearity Test to examine whether the independent variables are highly correlated with each other, and the Heteroscedasticity Test to determine whether the variance of the residuals is constant across observations.

The normality test determines whether the data for each variable are normally distributed. This test employs a normality test, in which the normality of the data is determined by the significance value. The data are considered normally distributed if the Sig value obtained from the calculation is greater than the alpha level of 5%, or Sig > 0.05. The normality of the data was assessed using the Kolmogorov–Smirnov and Shapiro–Wilk tests. The Kolmogorov–Smirnov test results indicate that all variables have p-values greater than 0.05. Specifically, the significance values for Vocational High School Quality, Link and Match, Teacher Professional Competence, and School Culture are all 0.200, indicating that the data are normally distributed.

Similarly, the Shapiro–Wilk test results support this finding, with significance values of 0.074 for Vocational High School Quality, 0.054 for Link and Match, 0.065 for Teacher Professional Competence, and 0.053 for School Culture. Since all p-values exceed 0.05, it can be concluded that the data for all variables follow a normal distribution. Therefore, the normality assumption required for further regression analysis has been fulfilled. The linearity test determines whether the relationship

between the independent and dependent variables is linear. The criterion for assessing linearity is that if the significance value (Deviation from Linearity) is greater than 0.05, a linear relationship exists. Conversely, if the significance value is less than 0.05, it indicates that the relationship is not linear.

The linearity test results indicate that all independent variables are linearly related to Vocational High School Quality. The significance value of the Deviation from Linearity for the Link and Match variable is 0.152, which is greater than 0.05, indicating no significant deviation from linearity. Similarly, Teacher Professional Competence shows a significance value of 0.941 for the Deviation from Linearity, which also exceeds the 0.05 threshold. In addition, the School Culture variable has a significance value of 0.226, which is greater than 0.05, indicating the absence of a non-linear relationship. Overall, these results demonstrate that the relationships between Link and Match, Teacher Professional Competence, School Culture, and Vocational High School Quality are linear. Therefore, the linearity assumption for regression analysis has been fulfilled.

The multicollinearity test examines whether the independent variables in a regression model are correlated. A good regression model should not exhibit correlation between independent variables. Multicollinearity is assessed using the Variance Inflation Factor (VIF) and Tolerance values. The multicollinearity test results indicate that there is no multicollinearity among the independent variables. The Link and Match variable has a tolerance value of 0.684 and a Variance Inflation Factor (VIF) value of 1.461. Teacher Professional Competence shows a tolerance value of 0.714 and a VIF value of 1.401. Similarly, the School Culture variable has a tolerance value of 0.691 and a VIF value of 1.447. Since all tolerance values are greater than 0.10 and all VIF values are well below 10, it can be concluded that the independent variables do not exhibit multicollinearity. Therefore, the multicollinearity assumption for regression analysis has been satisfied.

The heteroscedasticity test examines whether the variance of the residuals differs across observations within the regression model. If the variance of the residuals remains constant across observations, it is referred to as homoscedasticity; otherwise, it is heteroscedastic. A good regression model exhibits homoscedasticity or shows no signs of heteroscedasticity. The heteroscedasticity test graph is shown in Figure 5.

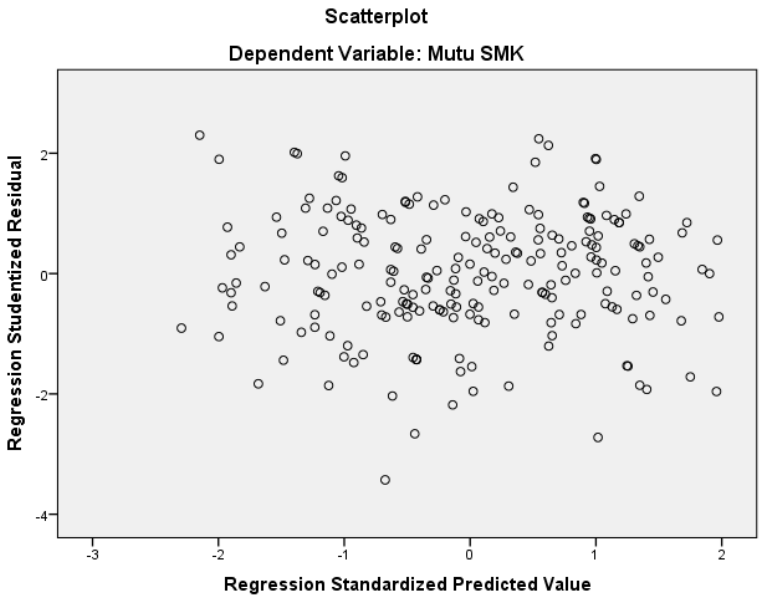



**Figure 5.** Heteroscedasticity Test

Based on Figure 5, there is no clear pattern, and the points are spread both above and below 0 on the Y-axis. Therefore, it can be concluded that heteroscedasticity is not present in the regression model. Given that all classical assumptions in linear regression analysis are satisfied, the regression model in this study is deemed valid and reliable for use as a basis for drawing the research conclusions. Hypothesis testing in this study was conducted using simple and multiple linear regression analyses with IBM SPSS 21 and Microsoft Office Excel 2016. The first hypothesis tested in this study is as follows: $H_a$ = There is an influence of the Link and Match program on the improvement of the quality of Public Vocational High School in Kendal Regency; $H_0$ = There is no influence of the Link and Match program on the improvement of the quality of Public Vocational High School in Kendal Regency.

The results of the product–moment correlation coefficient are used to determine the relationship between the Link and Match program and the improvement of the quality of Public Vocational High School in Kendal Regency. The correlation coefficient between the Link and Match program and improvements in Vocational High School quality is 0.736. This value indicates a strong relationship between the Link and Match program and improvements in Vocational High School quality. To determine whether the hypothesis proposed in this study is accepted or rejected, the results show that the calculated t-value for the Link and Match program is 11.336, while the t-table value is 1.98373 (11.336 > 1.98373), with a significance value of 0.000 < 0.05. Therefore, H0 is rejected, and Ha is accepted, indicating that the Link and Match program significantly improves the quality of Public Vocational High School in Kendal Regency. Furthermore, to determine the magnitude of the Link and Match program's contribution to improving Vocational High School quality, the coefficient of determination (R-square) is used, expressed as a percentage.

**Table 2**. Contribution of the Link and Match Program to the Improvement of Vocational High School Quality

| **Model Summary** | | | | |
|---|---|---|---|---|
| **Model** | **R** | **R Square** | **Adjusted R-Square** | **Std. Error of the Estimate** |
| 1 | ,763[a] | ,542 | ,540 | 5,024 |

a. Predictors: (Constant), Vocational High School Quality

The results of the coefficient of determination test in the table above show that the R-square value is 0.542, indicating that the Link and Match program has a moderate influence on improving Vocational High School quality. This result indicates that the Link and Match program accounts for 54.2% of the improvement in the quality of Public Vocational High School in Kendal Regency. The remaining 45.8% may be influenced by other variables not examined in this study, such as government policies, the quality of school human resources, and the quality of learning.

Furthermore, the positive regression coefficient (0.617) indicates that the Link and Match program and the improvement in Vocational High School quality are positively related, meaning that every increase in the Link and Match program will improve Vocational High School quality by 0.617. Therefore, the better the implementation of the Link and Match program, the higher the improvement in the quality of Public Vocational High School in Kendal Regency. The second hypothesis tested in this study is as follows: Ha = There is an influence of teachers' professional competence on the improvement of the quality of Public Vocational High School in Kendal Regency. H0 = There is no influence of teachers' professional competence on the improvement of the quality of the Public Vocational High School in Kendal Regency.

The results of the product–moment correlation coefficient were used to determine the relationship between teachers' professional competence and the improvement of the quality of Public Vocational High School in Kendal Regency. The correlation coefficient between teachers' professional

competence and the improvement of Vocational High School quality is 0.494. This value indicates a moderate relationship between teachers' professional competence and improvements in Vocational High School quality. To determine whether the hypothesis proposed in this study is accepted or rejected, the results show that the calculated t-value for teachers' professional competence is 8.370, while the t-table value is 1.98373 (8.370 > 1.98373), with a significance value of 0.000 < 0.05. Therefore, H0 is rejected, and Ha is accepted, indicating that teachers' professional competence significantly improves the quality of Public Vocational High School in Kendal Regency. Furthermore, to determine the magnitude of teachers' professional competence's contribution to improving Vocational High School quality, the coefficient of determination (R-square) is used, expressed as a percentage.

**Table 3**. Contribution of Teachers' Professional Competence to the Improvement of Vocational High School Quality

| **Model Summary** | | | | |
|---|---|---|---|---|
| **Model** | **R** | **R Square** | **Adjusted R-Square** | **Std. Error of the Estimate** |
| 1 | ,494a | ,244 | ,241 | 6,455 |

a. Predictors: (Constant), Vocational High School Quality

The results of the coefficient of determination test in the table above show that the R-square value is 0.244, indicating that teachers' professional competence has a small effect on the improvement of Vocational High School quality. This means that teachers' professional competence accounts for 24.4% of the improvement in the quality of the Public Vocational High School in Kendal Regency. In comparison, the remaining 75.6% may be influenced by other variables not examined in this study, such as the availability of facilities and infrastructure, teachers' intrinsic motivation, and teachers' pedagogical competence.

Furthermore, the positive regression coefficient indicates that teachers' professional competence is positively associated with improvements in Vocational High School quality, meaning that every increase in teachers' professional competence will improve Vocational High School quality by 0.692. Therefore, the better the teachers' professional competence, the greater the improvement in the quality of the Public Vocational High School in Kendal Regency. The third hypothesis tested in this study is as follows: $H_a$ = There is an influence of school culture on the improvement of the quality of Public Vocational High School in Kendal Regency. $H_0$ = There is no influence of school culture on the improvement of the quality of Public Vocational High School in Kendal Regency.

The results of the product–moment correlation coefficient are used to determine the relationship between school culture and the improvement of the quality of Public Vocational High School in Kendal Regency. The correlation coefficient between school culture and the improvement of Vocational High School quality is 0.491. This value indicates a moderate relationship between school culture and improvements in Vocational High School quality. To determine whether the hypothesis proposed in this study is accepted or rejected. The results show that the calculated t-value for school culture is 8.303, while the t-table value is 1.98373 (8.303 > 1.98373), with a significance value of 0.000 < 0.05. Therefore, H0 is rejected, and Ha is accepted, indicating that school culture has a significant effect on the improvement of the quality of Public Vocational High School in Kendal Regency. Furthermore, to determine the magnitude of school culture's contribution to improving Vocational High School quality, the coefficient of determination (R-square) is used, expressed as a percentage.

**Table 4**. Contribution of School Culture to the Improvement of Vocational High School Quality

| Model Summary | | | | |
|---|---|---|---|---|
| **Model** | **R** | **R Square** | **Adjusted R-Square** | **Std. Error of the Estimate** |
| 1 | ,491[a] | ,241 | ,238 | 6,468 |

a. Predictors: (Constant), Vocational High School Quality

The results of the coefficient of determination test in the table above show that the R-square value is 0.241, indicating that school culture has a small effect on the improvement of Vocational High School quality. This means that school culture contributes 24.1% to improving the quality of the Public Vocational High School in Kendal Regency. In comparison, the remaining 75.9% may be influenced by other variables not examined in this study, such as the school's organizational climate and the involvement of industry partners. Furthermore, the positive regression coefficient indicates that school culture and the improvement of Vocational High School quality are positively related, meaning that every increase in school culture will improve Vocational High School quality by 0.656. Therefore, the better the school culture, the greater the improvement in the quality of Public Vocational High School in Kendal Regency. The fourth hypothesis tested in this study is as follows: Ha = There is an effect of the link and match program, teachers' professional competence, and the school culture on the improvement of the quality of the public Vocational High School in Kendal Regency. H0 = There is no effect of the link and match program, teachers' professional competence, and the school culture on the improvement of the quality of the public Vocational High School in Kendal Regency.

The results of the multiple correlation coefficient analysis, which aim to determine the relationships among the link-and-match program, teachers' professional competence, and school culture, and the improvement in the quality of public Vocational High Schools in Kendal Regency. The correlation coefficient between the link-and-match program, teachers' professional competence, school culture, and the improvement of Vocational High School quality is 0.876. This result indicates a very strong relationship between the link-and-match program, teachers' professional competence, and school culture, and the improvement of Vocational High School quality. To determine whether the proposed hypothesis in this study is accepted or rejected. The results show that the calculated F-value for the link and match program, teachers' professional competence, and school culture is 99.944, while the F-table value is 2.60 (99.944 > 2.60), with a significance value of 0.000 < 0.05. Therefore, H0 is rejected, and Ha is accepted, indicating that the link-and-match program, teachers' professional competence, and school culture have a significant effect on improving the quality of public Vocational High Schools in Kendal Regency. Furthermore, to determine the magnitude of the contributions of the link-and-match program, teachers' professional competence, and school culture to Vocational High School quality, the coefficient of determination (R-square) is expressed as a percentage.

**Table 5**. Contribution of the Link and Match Program, Teachers' Professional Competence, and School Culture to the Improvement of Vocational High School Quality

| Model Summary | | | | |
|---|---|---|---|---|
| **Model** | **R** | **R Square** | **Adjusted R Square** | **Std. Error of the Estimate** |
| 1 | .876[a] | ,767 | ,764 | 3,601 |

a. Predictors: (Constant), the Link and Match Program, Teachers Professional Competence, and School Culture

The results of the coefficient of determination test in the table above show that the R-square value is 0.767, indicating that the link-and-match program, teachers' professional competence, and school culture have a strong influence on the improvement of Vocational High School quality. This

result indicates that the link-and-match program, teachers' professional competence, and school culture contribute 76.7% to the improvement in the quality of public Vocational High Schools in Kendal Regency. Meanwhile, the remaining 23.3% may be influenced by other variables not examined in this study, such as facilities and infrastructure, teachers' pedagogical competence, and learning program evaluation. Furthermore, to determine the regression equation, the results of the coefficient test can be used.

The multiple regression analysis indicates that the Link and Match program, Teacher Professional Competence, and School Culture have significant effects on Vocational High School Quality. The regression results show that the Link and Match program has a positive and statistically significant effect on Vocational High School Quality, with an unstandardized coefficient (B) of 0.617, a standardized coefficient (β) of 0.603, a t-value of 11.336, and a significance level of 0.000 ($p < 0.05$). This finding suggests that improvements in the implementation of the Link and Match program substantially enhance the quality of vocational high schools. Teacher Professional Competence also demonstrates a positive and significant influence on Vocational High School Quality, as indicated by an unstandardized coefficient (B) of 0.228, a standardized coefficient (β) of 0.163, a t-value of 3.129, and a significance value of 0.002 ($p < 0.05$). This result implies that higher levels of teacher professional competence contribute to improvements in vocational high school quality. Similarly, School Culture has a positive and significant effect on Vocational High School Quality, with an unstandardized coefficient (B) of 0.158, a standardized coefficient (β) of 0.118, a t-value of 2.223, and a significance level of 0.027 ($p < 0.05$). This indicates that a positive and supportive school culture plays an important role in enhancing vocational high school quality. Overall, the regression results confirm that all independent variables significantly and positively affect Vocational High School Quality, with the Link and Match program showing the strongest influence among the predictors.

## RESULTS AND DISCUSSION

The regression results confirm that the quality improvement of vocational high schools in Kendal Regency is jointly influenced by structural industry alignment, teacher professional competence, and school culture, underscoring the importance of an integrated quality improvement model. The novelty of this study does not lie in the introduction of new variables, but in its empirical integration of key determinants of vocational high school quality within a single explanatory model. Unlike previous studies that examined Link and Match, teacher competence, or school culture separately, this study simultaneously tests the relative contribution of these three variables in public vocational high schools. The findings reveal a clear quantitative hierarchy of influence, with the Link and Match program demonstrating the strongest effect (54.2%), followed by teachers' professional competence (24.4%) and school culture (24.1%). These findings are consistent with various theories and previous studies that state that educational quality results from interactions among inputs, processes, and the school environment. The theory of educational quality management emphasizes that quality cannot be achieved through a single factor; rather, it requires integrating systemic factors such as educator competence, external partnerships, and organizational culture. Previous studies, such as those by Kustanti et al (2024) and Salik (2024), demonstrated that alignment among school–industry relationships, teacher competence, and school culture is a strong determinant of improving the quality of Vocational High Schools. Therefore, the results of this study reinforce the view that these three variables should be regarded as an interconnected and complementary unity in shaping overall school quality.

From a theoretical perspective, these findings strengthen a systemic understanding of the improvement of vocational school quality. The dominant contribution of the Link and Match program ($\beta = 0.603$) indicates that vocational education quality is primarily driven by external structural

alignment with industry, rather than by internal school factors alone. In this context, Link and Match function as a structural driver at the system level, shaping curriculum relevance, learning facilities, graduate absorption, and industry trust. Meanwhile, teachers' professional competence and school culture operate as institutional enablers that support and amplify the effectiveness of industry–school alignment, rather than acting as independent primary drivers of quality improvement.

The stronger influence of the Link and Match program compared to teacher professional competence can be explained by its direct and systemic impact on core educational components. Link and Match simultaneously shape curriculum relevance, access to industry-standard facilities, learning processes through Teaching Factory models, and mechanisms for graduate absorption. These interventions affect vocational school quality across multiple dimensions, including input, process, output, and outcome. In contrast, teacher professional competence primarily influences instructional processes at the classroom level, resulting in a more indirect pathway of impact on overall school quality. Consequently, improvements in teacher competence, when not accompanied by strong external alignment with industry, tend to produce limited effects on vocational school quality enhancement.

Furthermore, the R-square value of 0.767 indicates that the link-and-match program, teachers' professional competence, and school culture explain 76.7% of the variation in the improvement of public Vocational High School quality in Kendal Regency. This represents a very high level of contribution to educational research, indicating that the majority of improvements in school quality depend on these three variables. The influence of 76.7% reflects that school quality is strongly determined by the strength of the school's partnership with the business and industrial sectors, teachers' ability to manage learning professionally, and a school culture that supports the creation of a productive, character-building work climate and learning environment.

Several methodological considerations should be taken into account when interpreting the findings of this study. The data were collected exclusively through teacher-reported questionnaires, which may introduce institutional bias. As a result, the strong explanatory power observed in this study may partly reflect teachers' perspectives on school quality and industry alignment. Future studies are therefore encouraged to triangulate these findings using data from industry partners, vocational graduates, students, or employment records to provide a more comprehensive and multi-stakeholder assessment. In addition, as this study was conducted within a single regency using a cross-sectional design, caution should be exercised in generalizing the findings to other regional contexts or in inferring long-term causal relationships.

One distinctive finding of this study lies in the exceptionally high coefficient of determination ($R^2$ = 0.767), which is relatively uncommon in educational research. This result indicates that improvements in vocational high school quality cannot be sufficiently explained by internal school excellence alone. The findings empirically demonstrate that increases in teacher professional competence or school culture, when not accompanied by strong external alignment with industry, are insufficient to enhance vocational school quality substantially. This finding directly challenges the commonly held assumption that improvements in teacher competence alone will automatically lead to higher vocational school quality. Although their individual contributions are smaller, teacher competence and school culture function as necessary conditions that enable the effectiveness of the Link and Match program. Without competent teachers and a supportive school culture, industry alignment cannot be translated into meaningful learning processes or sustainable quality improvement.

From a practical and policy perspective, the findings of this study indicate that vocational school improvement policies should prioritize strengthening structured, sustainable Link and Match partnerships with industry rather than treating industry alignment as a complementary program. For

provincial education authorities and the Directorate of Vocational Education, this implies that Link and Match indicators—such as industry-based curriculum alignment, Teaching Factory implementation, teacher industry internships, and graduate absorption rates—should be positioned as core performance benchmarks for public vocational high schools. Prioritizing these indicators ensures that quality improvement in vocational education remains directly aligned with labor market demands.

This study also highlights important budgetary implications for the development of vocational education. Strengthening the Link and Match program requires targeted investment in industry collaboration, including the development of industrial classes, shared facilities, and structured teacher internships. Allocating resources primarily to conventional teacher training programs without parallel industry engagement risks reinforcing a new mismatch, in which pedagogical capacity improves but graduate competencies remain misaligned with labor market needs. Therefore, vocational education funding strategies should be designed to support industry alignment and internal school capacity development simultaneously.

From the perspective of the link-and-match concept, the stronger the connection and alignment between schools and the business–industrial sectors, the more relevant the competencies developed by students become to the needs of the labor market. This has a direct impact on the quality of graduates, the quality of learning, and the school's reputation as an adaptive and responsive vocational institution. Teachers with high professional competence can translate industry needs into meaningful learning experiences, develop innovative teaching practices, and conduct relevant evaluations and assessments. Meanwhile, a positive school culture reinforces collective commitment to achieving quality through discipline, work ethic, collaboration, and the internalization of integrity values that characterize Vocational High School as *Schools of Integrity*. The findings of this study are also consistent with the research by Agustian et al. (2024), which highlights the need to strengthen school culture and industry collaboration as key factors in enhancing graduates' work-readiness and employability. The study demonstrates that an adaptive school culture aligned with industrial practices is an important strategy for bridging the gap between Vocational High Schools and labor-market demands.

Furthermore, pedagogical competence, professional competence, and parental participation simultaneously influence educational quality, as evidenced by an F-test with an F (3, 3) of 13.842 and a 2-tailed significance value of 0.000. This means that the quality of education in a school will improve if teachers possess strong pedagogical and professional competencies that support effective learning processes. Teachers must also collaborate with parents regarding the learning process, including communicating students' learning outcomes as well as the school's vision and mission (Kustanti et al., 2024). Overall, the results of this study affirm that the better the implementation of the link and match program, the higher the level of teachers' professional competence, and the stronger the established school culture, the greater the improvement in the quality of public vocational high schools in Kendal Regency. These three variables operate simultaneously and systematically to create high-quality learning processes and outcomes. Thus, efforts to improve school quality should focus on strengthening partnerships with industry, enhancing teacher competence through continuous development programs, and cultivating a productive, collaborative, and integrity-based school culture. These findings have important implications for policymakers at the school and regional government levels, indicating that improving Vocational High School quality requires an integrated, sustainable approach aligned with the real needs of the labor market.

## CONCLUSION

This study provides evidence that the link and match program, teachers' professional competence, and school culture play crucial roles in improving the quality of public vocational high schools (Vocational High School) in Kendal Regency. By integrating curriculum alignment with industry, enhancing teachers' competencies, and implementing an industry-oriented culture within schools, these elements can serve as continuous improvement mechanisms and value propositions for Vocational High School in the eyes of labor-market stakeholders, such as industries. From a policy perspective, this study emphasizes the importance of integrating work systems, competencies, and industrial culture into the conditions of vocational schools. Stronger connections between industries and Vocational High Schools will enable Vocational High School quality to progress more linearly with the rapidly evolving needs of the industrial sector. However, this study has limitations: it includes only vocational high schools within a single regency and captures perspectives exclusively from teachers. This opens opportunities for future research involving a more diverse set of stakeholders, such as students, parents, industry partners, and education supervisors. Employing qualitative approaches or longitudinal designs may also provide deeper insights into how intensive interactions between schools and industries shape dynamic, reciprocal relationships in Vocational High School. In conclusion, while the link-and-match program offers an essential strategy for shaping Vocational High School quality aligned with industry needs, its effectiveness depends on synergistic support from competent teachers and a school culture that is humanistic, value-driven, and character-oriented. Together, these components can create an ideal model for high-quality vocational high schools.

## DECLARATION OF GENERATIVE AI

The authors declare that no generative AI or AI-assisted technologies were used in the writing process of this manuscript.

## CONFLICTING INTEREST STATEMENT

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## REFERENCES

Agustian, D., Amartha, A., & Wardoyo, S. (2024). Tantangan Pendidikan Vokasional dalam Meningkatkan Penyerapan Lulusan SMK di Dunia Industri. *Jurnal Studi Guru dan Pembelajaran, 7*(3).

Badan Pusat Statistik (BPS). (2024). Tingkat Pengangguran Terbuka menurut Latar Belakang Pendidikan Februari 2024.

Borotoding, K., Limbong, M., & Tampubolon, H. (2021). Pengaruh kepemimpinan kepala sekolah terhadap mutu pendidikan di SMK Kristen Bittuang *(The Influence of Principal Leadership on the Quality of Education at Bittuang Christian Vocational School)*. Jurnal Pendidikan Tambusai, 5(1), 1–6.

Deal, T. E., & Peterson, K. D. (2015). *Shaping School Culture Fieldbook*. Jossey-Bass Publishers.

Dina, A., Yohanda, D., Fitri, J., Hakiki, M. U., & Sukatin, S. (2022). Teori Kinerja Guru dalam Meningkatkan Mutu Pendidikan. *Jurnal Edukasi Non Formal, 3*(1), 149–158.

Direktorat Sekolah Menengah Kejuruan, Direktorat Jenderal Pendidikan Vokasi, Pendidikan Khusus dan Pendidikan Layanan Khusus, Kementerian Pendidikan Dasar dan Menengah Republik Indonesia. (2025). *Program Pengembangan Sekolah Menengah Kejuruan Tahun 2025*. Kemendikdasmen.

Direktorat Pembinaan SMK. (2019). *Model Pengelolaan Teaching Factory Berbasis Potensi Sekolah dan Wilayah/Geografis*.

Kartiningsih, V. D. (2024). Pengaruh kompetensi profesional guru dan fasilitas belajar terhadap mutu pendidikan di SMK PK BIM Jombang. Lunggi Journal: Literasi Unggulan Ilmiah Multidisipliner, 2(4), 571–582.

Komala, N. & Wailanduw, A. G. (2021). Evaluasi pembelajaran program link and match dengan dunia usaha/industri pada kompetensi keahlian teknik kendaraan ringan di SMK Negeri 3 Surabaya. Jurnal Pendidikan Teknik Mesin (JPTM), 10(2), 68–76.

Kustanti, N., Abdullah, G., & Ginting, R. B. (2024). Pengaruh Kompetensi Pedagogik, Kompetensi Profesional Guru dan Partisipasi Orang Tua terhadap Mutu Pendidikan. *Jurnal Manajemen Pendidikan, 13*(1).

Maryamah, Eva. (2016). *Pengembangan Budaya Sekolah.* TARBAWI, Vol. 2 No. 02, 86–96. Banten: IAIN SMH Banten.

Mulyadi, Y., Sumarto, S., & Maknun, J. (2017). Continuing Professional Development a Vocational High School Teacher in West Java. *INVOTEC, 13*(1), 6261.

Ningsih, Y. S., Ernawati, & Mardizal, J. (2024). Perencanaan, Implementasi, dan Evaluasi Perbaikan Mutu Pendidikan Berbasis Kemitraan di Sekolah Menengah Kejuruan. *Jurnal Penelitian Guru Indonesia*.

Nursidah, N., Yunus, M., & Elpisah, E. (2021). Pengaruh supervisi akademik kepala sekolah dan budaya sekolah terhadap mutu mengajar guru. Jurnal Pendidikan Ekonomi (JUPE), 10(1), 38–44.

Pambayun, N. A. Y., Haryana, K., Yuswono, L. C., & Sukaswanto. (2024). Peranan Sertifikasi Keahlian dalam Memantapkan Kompetensi Profesional Guru SMK Teknik Kendaraan Ringan. *Jurnal Taman Vokasi, 8*(1), 7853.

Rohmatika, A. N., & Sudira, P. (2025). A Systematic Review: Habituation of Industrial Work Culture in Supporting the Employability of Vocational Students in the Field of Engineering Technology. *International Journal of Research and Innovation in Social Science (IJRISS)*.

Salik, Umdatus., dkk. 2024. Pengaruh Kepemimpinan Kepala Sekolah, Profesionalisme Guru dan Motivasi Kerja Terhadap Mutu Sekolah. Jurnal Inovasi Pembelajaran di Sekolah (JIPS), 5(2), 736-746.

Sugiyono. (2024). *Metode Penelitian Kuantitatif*. Penerbit Alfabeta.

Syaifudin, I., Khamidi, A., & Haq, M. S. (2024). Implementasi Penjaminan Mutu Pendidikan Vokasi untuk Memenuhi Kebutuhan Dunia Kerja: Studi Multi-Situs di SMK Negeri 1 Cerme dan SMK Negeri 1 Duduksampeyan. *JPG: Jurnal Pendidikan Guru, 6*(3).

Syuhada, S., & Mayasari. (2024). *Kompetensi Guru dan Faktor yang Mempengaruhinya*. Sonpedia Publishing Indonesia.

Zuhri, S., & Mastiani, E. (2024). Pengelolaan Kelas Industri dalam Meningkatkan Keterserapan Lulusan SMK di Dunia Kerja. *Jurnal Manajemen Pendidikan dan Ilmu Sosial, 6*(6).