

Determinants of Link and Match in Vocational High Schools: The Role of Effective Leadership, Curriculum Management, and Teachers' Professional Competence

Erik Darius Sulivanto^{1*}, Nurkolis², Supriyono PS³

Magister Manajemen Pendidikan, Universitas PGRI Semarang, Indonesia¹²³⁴

*Email Korespondensi: wongjetis@gmail.com

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ABSTRACT

The successful implementation of the link and match policy in vocational education requires effective leadership, adaptive curriculum management, and teachers' professional competence. However, empirical evidence examining their combined contribution remains limited, particularly in Indonesian vocational high schools. This study analyzed the effects of effective leadership, curriculum management, and teachers' professional competence on the implementation of link and match in public vocational high schools in Grobogan Regency, Indonesia. A quantitative correlational design was employed involving 166 teachers selected through proportional random sampling from three public vocational high schools. Data were collected using validated questionnaires and analyzed using descriptive statistics and multiple linear regression after meeting the assumptions of normality, linearity, multicollinearity, and heteroscedasticity. The results indicated that all three variables had positive and significant effects on link and match implementation. Teachers' professional competence showed the strongest contribution, emphasizing its role in translating curriculum into industry-relevant learning. Collectively, the three variables explained 98.2% of the variance in link and match implementation. These findings highlight the importance of integrating instructional leadership, curriculum management, and continuous teacher professional development to strengthen vocational education quality and better align school outcomes with industry needs.

INTRODUCTION

Vocational education plays a strategic role in preparing a competent workforce capable of meeting the demands of the business, industrial, and labor sectors. At the level of Vocational High Schools (Sekolah Menengah Kejuruan/SMKs), the quality of education is assessed not only by students' graduation rates but also by the extent to which graduates' competencies align with industry requirements. Consequently, the concept of *link and match* has become a central policy for enhancing the relevance of vocational education through curriculum alignment, school-

industry partnerships, practice-based learning, and the strengthening of teachers' professional competencies (Maulina & Yoenanto, 2022; Asrin et al., 2022).

The Indonesian government has continuously reinforced the implementation of the *link and match* policy through vocational school revitalization programs, the Vocational Center of Excellence (SMK Pusat Keunggulan) initiative, and the *Link and Match 8+i* framework, which emphasizes sustainable collaboration between schools and business, industry, and the labor market in curriculum development, industrial internships, competency certification, and graduate employment (Sari et al., 2025). Nevertheless, various indicators suggest that these initiatives have not yet fully bridged the gap between graduates' competencies and labor market demands. According to Statistics Indonesia, vocational high school graduates continue to experience the highest open unemployment rate among all educational levels, indicating the persistence of *skills mismatch*, or the discrepancy between graduates' competencies and workplace requirements (Ningrum, 2025). Similarly, Wibisono et al. (2020) reported that the alignment of vocational graduates' competencies with industry needs still requires significant improvement through curriculum synchronization and enhanced instructional quality.

A similar situation is evident in public vocational high schools in Grobogan Regency. Although graduate employment rates are relatively high, many graduates are employed in occupations unrelated to their areas of vocational specialization. This condition indicates that the success of the *link and match* policy should not be measured solely by graduate employment but also by the degree of alignment between graduates' competencies and industry requirements (Arbah et al., 2023). Previous studies have emphasized that the successful implementation of *link and match* depends largely on effective school management, particularly in establishing industry partnerships, managing educational programs, and ensuring that learning processes remain responsive to changes in the labor market (Nasution et al., 2022; Dese et al., 2024). Therefore, strengthening *link and match* should be viewed as an integral component of educational management involving school leadership, curriculum management, and teacher professional development.

The successful implementation of *link and match* is determined not only by partnerships between schools and industry but also by schools' capacity to manage educational resources effectively. In this regard, effective leadership, curriculum management, and teachers' professional competence constitute interrelated strategic factors that contribute to producing graduates whose competencies meet workforce demands.

Principals' leadership plays a vital role in formulating educational policies, establishing partnerships with business and industry, mobilizing school communities, and fostering an organizational culture that supports the continuous improvement of vocational education quality. Principals who demonstrate effective leadership are better able to encourage collaboration, promote instructional innovation, and make decisions that respond to industrial developments (Pujiyati & Senjaya, 2025). Previous studies have consistently reported that principals' leadership positively influences school quality, teacher performance, and the effectiveness of educational resource management (Susanto & Pujiyati, 2024; Carti et al., 2023; Septeri et al., 2024). Within the vocational education context, adaptive leadership is also considered essential for developing sustainable partnerships with industry (Wahyuni et al., 2025; Marlyna et al., 2025).

In addition to leadership, curriculum management ensures that graduates' competencies remain aligned with technological advances and labor market requirements. Effective curriculum management encompasses curriculum planning, implementation, evaluation, and synchronization with industrial competency standards to ensure that instructional processes remain relevant to the rapidly changing workplace (Fadli & Iskarim, 2024; Hermawan et al., 2024). The effectiveness of curriculum implementation is further influenced by the systematic integration of planning, implementation, and evaluation processes (Priyono et al., 2021; Putri et al., 2021).

Teachers' professional competence is another key determinant of successful curriculum implementation in vocational classrooms. Vocational teachers are expected to possess strong subject-matter expertise, understand current industrial technologies, and apply practice-oriented instructional approaches. Such competencies are influenced by school leadership, organizational climate, industrial experience, and continuous professional development (Hikmah et al., 2023; Hakim & Haryana, 2021). Other studies have demonstrated that teachers' professional competence contributes significantly to improving instructional quality, teacher performance, and students' learning outcomes (Mahram et al., 2023; Putri et al., 2023; Yuliati et al., 2021). Therefore, the synergy among these three factors forms a crucial foundation for enhancing the effectiveness of *link and match* implementation in vocational high schools.

Previous research has extensively examined the implementation of *link and match* in vocational education, particularly concerning school-industry partnerships, the effectiveness of vocational school revitalization programs, and the management of collaboration with business and industry (Maulina & Yoenanto, 2022; Nasution et al., 2022; Dese et al., 2024; Sari et al., 2025). Other studies have focused on the influence of principals' leadership on school quality, teacher performance, and educational management effectiveness (Susanto & Pujiyati, 2024; Carti et al., 2023; Septeri et al., 2024), whereas curriculum management research has emphasized the importance of developing adaptive curricula that respond to scientific advancement, technological innovation, and labor market demands (Fadli & Iskarim, 2024; Hermawan et al., 2024; Priyono et al., 2021; Putri et al., 2021). Meanwhile, studies on teachers' professional competence have highlighted the importance of competency development, industrial experience, and continuous professional learning in improving instructional quality within vocational education (Hikmah et al., 2023; Hakim & Haryana, 2021; Mahram et al., 2023; Putri et al., 2023; Yuliati et al., 2021).

Despite these contributions, previous studies have generally examined each variable independently, providing only a partial understanding of the organizational factors influencing the successful implementation of *link and match*. Moreover, empirical research investigating the simultaneous effects of effective leadership, curriculum management, and teachers' professional competence on the successful implementation of *link and match* in public vocational high schools remains limited, particularly in the context of Grobogan Regency, which possesses distinct socioeconomic characteristics and industrial potential compared with other regions. This limitation highlights an important research gap that warrants further investigation.

Addressing this gap, the present study offers a novel empirical analysis of the contributions of principals' effective leadership, curriculum management, and teachers' professional competence to the successful implementation of *link and match* in public vocational high schools

throughout Grobogan Regency. Unlike previous studies that have examined these variables separately, this study integrates the three variables into a single conceptual model to explain the organizational factors influencing the alignment between vocational education and the needs of business, industry, and the labor market. Accordingly, this study aims to examine the partial and simultaneous effects of effective leadership, curriculum management, and teachers' professional competence on the successful implementation of *link and match*. The findings are expected to contribute to the advancement of vocational education management literature while providing practical recommendations for school principals and policymakers to enhance the relevance of vocational education graduates to labor market demands.

RESEARCH METHODOLOGY

This study employed a quantitative approach using an ex post facto research design and a survey method. The ex post facto approach was selected because the study aimed to examine the relationships and effects among variables based on existing conditions without manipulating or administering any treatment to the research subjects. The research adopted an explanatory design to investigate the effects of principals' effective leadership, curriculum management, and teachers' professional competence on the successful implementation of *link and match* in vocational high schools.

The study was conducted at three public vocational high schools in Grobogan Regency, namely SMK Negeri 1 Purwodadi, SMK Negeri 2 Purwodadi, and SMK Negeri 1 Wirosari, during the 2025/2026 academic year. The research population consisted of 282 teachers from the three schools. The sample size was determined using the Taro Yamane formula with a 5% margin of error, resulting in a sample of 166 respondents. A proportional random sampling technique was employed to ensure that each school was proportionally represented according to its teacher population. Accordingly, the sample comprised 56 teachers from SMK Negeri 1 Purwodadi, 61 teachers from SMK Negeri 2 Purwodadi, and 49 teachers from SMK Negeri 1 Wirosari. In addition, a pilot test of the research instrument was conducted with 30 respondents who were not included in the main study sample.

The independent variables consisted of effective leadership (X_1), curriculum management (X_2), and teachers' professional competence (X_3), whereas the dependent variable was the successful implementation of *link and match* (Y). Effective leadership was measured through five dimensions: vision setting, human resource development, organizational management, instructional quality, and collaboration. Curriculum management was assessed based on the functions of curriculum planning, organization, implementation, and evaluation. Teachers' professional competence was measured through subject matter mastery, instructional planning, instructional implementation, learning assessment, and classroom management. Meanwhile, the implementation of *link and match* was measured using indicators including curriculum alignment with industry needs, partnerships with business and industry, practice-based learning implementation, graduate quality and relevance, and graduate employment outcomes.

The research instrument consisted of a structured questionnaire developed from the indicators of each variable using a five point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Prior to the main data collection, the instrument was tested for validity using the Pearson Product-Moment correlation coefficient and for reliability using Cronbach's Alpha

coefficient with IBM SPSS Statistics version 26. The reliability analysis demonstrated that all variables achieved Cronbach's Alpha coefficients exceeding 0.90, namely 0.937 for *link and match*, 0.947 for effective leadership, 0.974 for curriculum management, and 0.917 for teachers' professional competence. These results indicate that all research instruments possessed excellent internal consistency and were therefore appropriate for data collection.

Data were collected through questionnaire administration to all selected respondents and supported by documentation to obtain school profile data and other relevant information. The collected data were analyzed using both descriptive and inferential statistics. Before hypothesis testing, the data were examined to ensure compliance with the assumptions required for multiple regression analysis. The prerequisite tests included the Kolmogorov-Smirnov normality test, linearity test, multicollinearity test using the Variance Inflation Factor (VIF), and heteroscedasticity test using the Glejser method.

Hypothesis testing was conducted using multiple linear regression analysis to examine both the partial and simultaneous effects of effective leadership, curriculum management, and teachers' professional competence on the successful implementation of *link and match*. The partial effects of each independent variable were analyzed using the *t*-test, whereas the simultaneous effect of all independent variables was examined using the *F*-test at a 5% significance level. The proportion of variance in the dependent variable explained by the three independent variables was determined using the coefficient of determination (R^2). All statistical analyses were performed using IBM SPSS Statistics version 26.

RESULT AND DISCUSSION

Result

Descriptive Statistics

This study involved 166 teachers from three public vocational high schools in Grobogan Regency as respondents. Descriptive statistical analysis was conducted to provide an overview of the research variables, including effective leadership, curriculum management, teachers' professional competence, and the implementation of *link and match*. The findings indicate that all variables exhibited relatively high mean scores with homogeneous data distributions. These results suggest that the respondents perceived the implementation of school leadership, curriculum management, teachers' professional competence, and *link and match* practices in their schools positively.

Table 1. Descriptive Statistics of the Research Variables

Variable	N	Mean	SD	Minimum	Maximum
Effective Leadership (X_1)	166	116.29	12.44	75	150
Curriculum Management (X_2)	166	115.46	11.35	85	146
Teachers' Professional Competence (X_3)	166	110.33	12.41	79	145
<i>Link and Match</i> (Y)	166	114.43	12.61	84	150

Source: Processed SPSS data, 2026.

As presented in Table 1, effective leadership recorded the highest mean score (116.29), whereas teachers' professional competence had a mean score of 110.33. The standard deviations

of all variables were lower than their respective means, indicating relatively homogeneous data and supporting the suitability of the dataset for subsequent statistical analyses.

Assumption Testing

Prior to hypothesis testing, the data were examined to ensure compliance with the assumptions required for multiple linear regression analysis. The prerequisite tests included normality, linearity, multicollinearity, and heteroscedasticity. The results confirmed that all assumptions were satisfied, indicating that the regression model was appropriate for examining the relationships among the research variables.

Table 2. Summary of the Assumption Tests

Assumption Test	Result	Decision
Normality	All Sig. values > 0.05	Data are normally distributed
Linearity	Sig. for Deviation from Linearity > 0.05	Linear relationship confirmed
Multicollinearity	Tolerance > 0.10; VIF = 1.608–2.834	No multicollinearity
Heteroscedasticity	All Sig. values > 0.05	No heteroscedasticity

Source: Processed SPSS data, 2025.

The normality test indicated that all variables had significance values greater than 0.05, confirming that the data were normally distributed. Tolerance values exceeding 0.10 and Variance Inflation Factor (VIF) values below 10 indicated the absence of multicollinearity. Furthermore, the results of the linearity and heteroscedasticity tests also met the required assumptions. Therefore, multiple linear regression analysis was considered appropriate for hypothesis testing.

Hypothesis Testing

Hypothesis testing was conducted using multiple linear regression analysis to examine the effects of effective leadership, curriculum management, and teachers' professional competence on the successful implementation of *link and match*. The analysis revealed that all three independent variables had positive and statistically significant effects, both individually and collectively.

The partial analysis showed that effective leadership had a significant positive effect on *link and match*, with a correlation coefficient of $r = 0.642$ and a coefficient of determination (R^2) of 0.413, indicating that effective leadership explained 41.3% of the variance in *link and match*. Curriculum management demonstrated a stronger relationship, with $r = 0.757$ and $R^2 = 0.574$, accounting for 57.4% of the variance in *link and match*. Teachers' professional competence exhibited the strongest relationship, with $r = 0.990$ and $R^2 = 0.979$, indicating that it was the most influential factor supporting the successful implementation of *link and match*. All partial hypothesis tests yielded significance values below 0.05; therefore, all three hypotheses were accepted.

The simultaneous analysis further demonstrated that effective leadership, curriculum management, and teachers' professional competence collectively exerted a highly significant

effect on *link and match*. The regression model produced an R value of 0.991, an Adjusted R^2 of 0.982, and an F value of 2922.323 with a significance level of 0.000. These findings indicate that the three independent variables jointly explained 98.2% of the variance in *link and match*, while the remaining 1.8% was attributable to factors outside the scope of the present study.

Table 3. Results of Multiple Linear Regression Analysis

Variable	B	β	t	Sig.
Constant	-0.914	-	-0.597	0.551
Effective Leadership	0.055	0.054	4.043	0.000
Curriculum Management	0.045	0.040	2.524	0.013
Teachers' Professional Competence	0.941	0.926	51.986	0.000
Statistic	Value			
R	0.991			
Adjusted R^2	0.982			
F	2922.323			
Sig. F	0.000			

Source: Processed SPSS data, 2026.

The resulting regression equation is expressed as follows: $Y = 0.914 + 0.055X_1 + 0.045X_2 + 0.941X_3$. The regression equation indicates that all regression coefficients are positive, implying that improvements in effective leadership, curriculum management, and teachers' professional competence are associated with corresponding improvements in the implementation of *link and match*. Based on the standardized beta coefficients (β), teachers' professional competence emerged as the most influential predictor of *link and match*, followed by effective leadership and curriculum management. These findings suggest that the successful implementation of *link and match* in public vocational high schools across Grobogan Regency is primarily determined by teachers' professional competence, which is further strengthened by effective school leadership and adaptive curriculum management.

Discussion

The Effect of Effective Leadership on Link and Match

The findings of this study indicate that effective leadership has a positive and significant effect on the implementation of *link and match* in public vocational high schools throughout Grobogan Regency. The coefficient of determination of 41.3% suggests that principals' leadership contributes substantially to strengthening the alignment between vocational education and the needs of business, industry, and the labor market (DUDIKA). This finding demonstrates that school principals play a strategic role in establishing an industry-oriented school vision, expanding partnership networks, optimizing school resources, and encouraging teachers to implement learning practices that are relevant to the evolving demands of the workplace.

These findings are consistent with the concept of instructional leadership, which positions school principals as key drivers of educational improvement through vision development, teacher support, and the creation of an organizational culture focused on continuous improvement (Hallinger, 2020). Bogler and Nir (2025) also found that instructional leadership

exerts both direct and indirect effects on the quality of twenty-first-century learning by enhancing teacher capacity and organizational effectiveness. Similarly, He et al. (2024) emphasized that effective school leadership promotes teachers' professional development, thereby improving curriculum implementation and student learning outcomes. Furthermore, Park et al. (2025) reported that leadership practices supporting teachers' professional growth contribute to improved student academic achievement through higher-quality instruction.

The results of this study also reinforce previous national research highlighting the importance of school leadership in the successful implementation of *link and match*. Asrin et al. (2022) demonstrated that principals serve as crucial intermediaries between schools and industry by fostering strategic partnerships and synchronizing educational programs with labor market needs. Pujiyati and Senjaya (2025) as well as Susanto and Pujiyati (2024) further explained that visionary leadership enhances both school management effectiveness and teacher performance. Therefore, the more effective the principal's leadership, the greater the school's capacity to produce graduates whose competencies align with industry demands. These findings imply that strengthening *link and match* requires not only government policy support but also effective school leadership capable of integrating industry partnerships, teacher development, and instructional innovation within a coherent and sustainable policy framework.

The Effect of Curriculum Management on Link and Match

The findings reveal that curriculum management has a positive and significant effect on the implementation of *link and match*, contributing 57.4% to the variance in the dependent variable, a contribution greater than that of effective leadership. This result indicates that the quality of curriculum management is a critical factor in ensuring the alignment of graduates' competencies with the needs of business, industry, and the labor market (DUDIKA). A curriculum that is systematically planned, implemented, and evaluated enables schools to align learning content, instructional approaches, and competency outcomes with technological developments and labor market requirements.

These findings support the theory of *curriculum making*, which views curriculum as a dynamic process that should be developed collaboratively through the involvement of teachers, school leaders, and external stakeholders, including industry representatives (Priestley et al., 2021). Harris et al. (2020) also argued that effective curriculum leadership plays a crucial role in improving instructional quality and ensuring that educational policies are implemented successfully. Within the context of vocational education, Voogt et al. (2021) explained that teacher collaboration in curriculum development leads to learning experiences that are more relevant to students' needs and workplace expectations. Likewise, Admiraal et al. (2021) found that schools functioning as professional learning communities are more capable of sustaining curriculum innovation, whereas Sahlberg (2021) emphasized that curriculum reform can only succeed when accompanied by changes in instructional practices and organizational culture.

The findings of this study are also consistent with previous national studies. Hermawan et al. (2024) reported that effective curriculum management enhances instructional quality through continuous planning, implementation, and evaluation processes. Fadli and Iskarim (2024) further argued that curricula must remain adaptive to technological advancements and labor market demands in order to maintain their relevance. Meanwhile, Priyono et al. (2021) emphasized that

successful curriculum implementation depends heavily on the consistent execution of planning, organizing, implementation, and evaluation functions. Therefore, the findings of this study suggest that strengthening *link and match* in vocational high schools cannot be achieved solely through expanding partnerships with business and industry. Rather, it must be supported by flexible, industry-oriented curriculum management that is continuously evaluated and refined to ensure that graduates possess competencies that meet contemporary workforce demands.

The Effect of Teachers' Professional Competence on the Successful Implementation of Link and Match

The findings revealed that teachers' professional competence had a positive and statistically significant effect on the successful implementation of *link and match* and emerged as the most influential predictor among the independent variables. This finding indicates that the success of *link and match* in vocational high schools is determined not only by school policies or curriculum management but also, and more importantly, by teachers' ability to translate the curriculum into instructional practices that meet the needs of business, industry, and the labor market. Teachers with high levels of professional competence are capable of mastering vocational subject matter, keeping pace with technological developments in industry, implementing practice-oriented instructional strategies, and guiding students in developing competencies that are relevant to labor market demands.

These findings are consistent with the systematic review conducted by Ventista and Brown (2023), which concluded that continuous, practice-oriented professional development has a positive impact on instructional quality and student learning outcomes. Similarly, El-Hamamsy et al. (2023) argued that systematically designed professional development programs enhance teachers' pedagogical and professional competencies through collaboration, reflective practice, and the integration of educational technologies. In the context of vocational education, a systematic review published in *Education Sciences* (2025) emphasized that improving vocational teachers' competencies should be closely linked to industrial experience, authentic learning, and continuous competency enhancement in response to technological advancements to produce graduates who are well prepared for employment. Furthermore, Zamiri and Esmaeili (2024) highlighted that a culture of knowledge sharing within professional learning communities plays a crucial role in strengthening teachers' competencies and fostering instructional innovation.

The findings of the present study also corroborate previous national research. Hikmah et al. (2023) reported that teachers' professional competence is influenced by principals' leadership, work motivation, and a supportive organizational climate. Hakim and Haryana (2021) further emphasized that professional certification and industrial experience are essential components of enhancing vocational teachers' professionalism, thereby making classroom instruction more relevant to workplace requirements. Likewise, Mahram et al. (2023) found that teachers' professional competence contributes significantly to improved teaching performance and instructional quality. Therefore, the findings of this study suggest that strengthening *link and match* requires sustainable teacher professional development strategies, including industry-based training, professional competency certification, industrial internships for teachers, and the reinforcement of professional learning communities. These initiatives are essential to ensure that

teachers' competencies remain aligned with technological developments and the evolving needs of the labor market.

The Simultaneous Effects of Effective Leadership, Curriculum Management, and Teachers' Professional Competence on the Successful Implementation of Link and Match

The findings demonstrated that effective leadership, curriculum management, and teachers' professional competence simultaneously exerted a positive and statistically significant influence on the successful implementation of *link and match* in public vocational high schools across Grobogan Regency. The Adjusted R^2 value of 0.982 indicates that these three variables jointly explain 98.2% of the variance in *link and match*. This result suggests that the success of vocational education in producing graduates whose competencies correspond to the needs of business, industry, and the labor market is not determined by a single factor but rather by the synergy among school leadership, curriculum management, and teachers' professionalism. Together, these components constitute an integrated educational management system that supports the delivery of learning experiences aligned with industry requirements.

These findings are consistent with the school improvement perspective, which posits that educational quality is enhanced through the interaction of multiple organizational components rather than through isolated improvements in individual aspects. Bogler and Nir (2025) argued that instructional leadership achieves optimal outcomes when accompanied by teacher capacity building and a school culture that supports instructional innovation. Likewise, Priestley et al. (2021) emphasized that effective curriculum implementation depends on collaboration among school leaders, teachers, and external stakeholders throughout the curriculum-making process. Admiraal et al. (2021) further demonstrated that schools functioning as professional learning communities are better equipped to integrate leadership, teachers' professional learning, and continuous curriculum innovation. Similarly, He et al. (2024) found that principals' leadership contributes to improving teachers' competencies by supporting their professional development, whereas Voogt et al. (2021) emphasized that teacher collaboration in curriculum development leads to more contextualized instruction that is responsive to both students' needs and labor market expectations.

The findings of this study also reinforce previous national studies. Maulina and Yoenanto (2022) reported that the successful implementation of *link and match* depends on the alignment among school policies, curriculum implementation, and partnerships with business and industry. Nasution et al. (2022) demonstrated that well-planned *link and match* management enhances the effectiveness of school-industry collaboration, while Sari et al. (2025) emphasized that implementing the *Link and Match 8+i* framework requires integrated support from school leadership, curriculum synchronization, and human resource readiness. Therefore, improving the quality of *link and match* in vocational high schools cannot be achieved through a fragmented approach. Instead, it requires a comprehensive educational management strategy that strengthens principals' leadership, promotes adaptive curriculum management responsive to the needs of business, industry, and the labor market, and continuously enhances teachers' professional competence. The synergy among these three dimensions will improve the relevance of graduates' competencies, strengthen school-industry partnerships, and ultimately enhance the employability and competitiveness of vocational high school graduates in the labor market.

CONCLUSION

This study demonstrates that effective leadership, curriculum management, and teachers' professional competence have positive and statistically significant effects on the successful implementation of *link and match* in public vocational high schools throughout Grobogan Regency, both individually and collectively. Effective leadership contributes to establishing a school vision aligned with the needs of business, industry, and the labor market, strengthening strategic partnerships, and directing school resources to support the delivery of relevant vocational education. Curriculum management plays a crucial role in ensuring that learning outcomes remain aligned with technological advancements and industry demands through adaptive processes of curriculum planning, implementation, and evaluation. Meanwhile, teachers' professional competence emerged as the most influential determinant of *link and match*, as teachers are the primary agents responsible for translating the curriculum into effective instructional practices and directly shaping students' competency development.

Collectively, the three variables explain a substantial proportion of the variance in the successful implementation of *link and match*, indicating that the effectiveness of vocational education cannot be achieved by strengthening a single aspect in isolation. Rather, it requires a synergistic interaction among school leadership, curriculum management, and teachers' professional development. These findings reinforce the educational management perspective that the effective implementation of *link and match* is the result of integrating multiple managerial functions supported by sustained collaboration between vocational schools and business, industry, and the labor market.

This study contributes theoretically by extending the literature on the determinants of *link and match* through the empirical testing of an integrated model that simultaneously incorporates three key educational management variables within the context of public vocational high schools. From a practical perspective, the findings provide valuable insights for school principals and policymakers in prioritizing the strengthening of instructional leadership, the development of adaptive industry-oriented curricula, and the enhancement of teachers' professional competence through continuous professional development, competency certification, and industry internship programs. These efforts are expected to improve the relevance of graduates' competencies to labor market demands and enhance the employability and competitiveness of vocational high school graduates.

This study has several limitations. First, it was conducted exclusively in public vocational high schools within a single regency, limiting the generalizability of the findings to broader contexts. Second, the research model included only three independent variables. Future studies are therefore encouraged to involve a wider geographical scope encompassing both public and private vocational high schools and to extend the research model by incorporating additional variables, such as school-industry partnerships, school organizational culture, technological readiness, and the implementation of *teaching factory* programs. Such investigations would provide a more comprehensive understanding of the factors influencing the successful implementation of *link and match* in vocational education.

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