

Analyzing the Link and Match Gap: A Comprehensive Review of Vocational Training Outcomes in Indonesia

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Abstract

Background – Indonesia, as the world's largest archipelagic country with a population of over 281 million, faces significant challenges in aligning workforce development with the mandates of Law No. 20 of 2003 on the National Education System. In the era of Industrial Revolution 4.0 and Society 5.0, vocational training institutions are required to produce adaptive, technologically literate, and skilled human resources. However, the rapid expansion of Vocational Training Centers has not been fully accompanied by improvements in training quality and labor market relevance.

Research Urgency – Persistent unemployment rates, significant skill mismatches, increasing global labor competition, and the lack of systematic synthesis of the link-and-match gap highlight the urgency of this study.

Research Objectives – This study aims to identify and analyze the key factors contributing to the misalignment between vocational training outcomes and labor market demands in Indonesia.

Research Method – This study employs a qualitative approach using a Systematic Literature Review (SLR) to identify, evaluate, and synthesize relevant studies on vocational education and training outcomes.

Research Findings – The analysis identifies ten major contributing factors, including curriculum rigidity, outdated infrastructure, weak industry collaboration, and insufficient integration of soft and technical skills. These gaps are categorized into four dimensions: quality, quantity, location, and timing.

Research Conclusion – Addressing the link-and-match gap requires a strategic shift from a supply-driven to a demand-driven approach through the implementation of a pentahelix collaboration model involving government, academia, industry, society, and media. Strengthening work-based learning and apprenticeship programs is essential to improve graduate readiness.

Research Novelty/Contribution – This study provides a systematic synthesis of vocational training challenges in Indonesia and proposes a practical framework that integrates industry alignment with local socio-cultural contexts to support sustainable workforce development.

Keywords: vocational education, vocational training, link and match, workforce development, pentahelix collaboration.

How to Cite:

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INTRODUCTION

Indonesia is widely recognized as the world's largest archipelagic country, consisting of approximately 17,499 islands stretching from Sabang to Merauke (Fernando & Condrobimo, 2019; Iryanti et al., 2021; Ariantoko et al., 2023). The total area of Indonesia reaches approximately 7.81 million km², which includes around 2.01 million km² of land area, 3.25 million km² of territorial waters, and an Exclusive Economic Zone (EEZ) covering about 2.55 million km² (Handoyo et al., 2020; Taufan & Irman, 2014). Furthermore, two-thirds of Indonesia's territory consists of ocean areas, which is reflected in the extensive coastline spread across its numerous islands. As a result, Indonesia has one of the longest coastlines in the world and ranks second after Canada in terms of coastline length (Suwarno et al., 2019; Chamdareno et al., 2019; Putra, 2017).

With such vast geographical conditions, Indonesia also has a large population. In 2023, the population was estimated to reach approximately 281.8 million people, influenced by factors such as birth rates, mortality rates, and migration (Rahman, 2023). In order to manage and improve the quality of human resources within this large population, the role of education becomes extremely important. The Indonesian education system is regulated by Law No. 20 of 2003 concerning the National Education System, which aims to develop learners' potential so that they become individuals who are faithful, pious, knowledgeable, creative, independent, democratic, and responsible citizens. Education therefore plays a strategic role in shaping a dignified civilization and in realizing the national ideals as stated in the Preamble of the 1945 Constitution.

Efforts to improve the quality of education and training have therefore become a major priority for the Indonesian government. These efforts are closely related to the national goals stated in the Preamble of the 1945 Constitution, particularly in advancing the intellectual life of the nation (Sri Winarsih, 2017). Education is not merely a process of transferring knowledge but also a means of developing character, improving skills, and shaping positive attitudes among learners (Kusumaningrum, 2019). However, in its implementation, the Indonesian education system continues to face several significant challenges, particularly related to issues of quality, relevance, and alignment with societal needs (Suryana, 2020; Nurhuda, 2022; Rabiah, 2019).

In addition, the rapid development of science and technology in the 21st century has significantly transformed the landscape of education. The emergence of globalization, the Industrial Revolution 4.0, and the concept of Society 5.0 has created new demands for education systems worldwide (Kahar et al., 2021; Barata, 2021). These developments require education systems to adapt quickly to technological advancements and the changing needs of society. Consequently, education must move beyond traditional paradigms and adopt more innovative and adaptive approaches to prepare individuals who are capable of competing in a global environment.

The era of globalization has also significantly influenced educational paradigms. Education is now expected to shift from a locally oriented perspective to a global outlook that prepares individuals to participate in an increasingly interconnected world (Bottery, 2006; Marković, 2008). Furthermore, education must encourage democratic participation, social cohesion, and responsible citizenship while simultaneously promoting human development rather than focusing solely on economic growth (Laode et al., 2020). These principles align with UNESCO's educational framework, which emphasizes four fundamental pillars of learning: learning to know, learning to do, learning to live together, and learning to be, as well as the concept of lifelong learning (Combes, 2005; Delors, 2013; Su, 2009).

The condition of a country's economy and the structure of its education system are closely interconnected and significantly influence scientific advancement, technological innovation, and industrial development (Dewi, 2019). In the context of the Industrial Revolution 4.0, the industrial sector has experienced rapid expansion driven by digitalization and technological integration. This transformation has increased the demand for a workforce equipped with new competencies, including advanced technical skills, digital literacy, and adaptive problem-solving abilities (Muspawi & Lestari, 2020; Mardhiyah, et al, 2021). Therefore, education and training institutions are required to continuously update their curricula and learning systems in order to meet the evolving demands of the labor market.

Previous studies have shown that rapid technological advancements have significantly increased the competency requirements for workers in the modern labor market. Industries now demand professionals who possess complex technical capabilities, particularly technicians and engineers who can adapt to technological innovations and industrial transformations (Putri, 2018). This situation places vocational education and training institutions in a strategic position in preparing a skilled workforce capable of meeting industrial demands.

In response to these challenges, the Indonesian government has launched various initiatives to improve workforce quality, including the vision of “Golden Indonesia 2045.” One of the efforts implemented is the establishment of Community Work Training Centers. In 2023, the government developed approximately 3,757 BLKK units within Islamic boarding schools across Indonesia (Muslikah et al., 2024). Fostering expertise and self-skill development among the community (Ariefianto, 2015). These institutions aim to strengthen community skills and improve workforce readiness. In addition, vocational high schools are designed to produce graduates who are ready to enter the workforce, supported by a national policy targeting a 70:30 ratio between vocational and general secondary education (Aryawan, 2021).

However, despite these initiatives, vocational education in Indonesia continues to face various structural challenges. These include the imbalance between student enrollment and infrastructure availability, limited numbers of teachers with industry-relevant competencies, insufficient collaboration between educational institutions and industries, and weaknesses in financial and institutional management. Furthermore, job opportunities for productive-age populations remain limited, resulting in a relatively high rate of educated unemployment (Fitriyanti & Pradana, 2022; Suaib & Agustina, 2022; Linggawati & Wenagama, 2022).

According to projections by the McKinsey Global Institute (MGI), Indonesia may experience a significant workforce skills gap by 2030. The country is predicted to face a surplus of workers with insufficient skills alongside a shortage of highly skilled professionals (Handayani, 2015). Similarly, the International Labour Organization (ILO) estimates that more than half of the labor force may not meet the required qualifications in terms of education and skills (Kusdamayanti et al., 2015). This situation presents a serious challenge, particularly in the context of regional economic integration such as the ASEAN Economic Community (AEC), where competition for skilled labor is increasingly intense. If Indonesia fails to supply sufficient skilled workers, these positions may be filled by foreign workers with higher competencies (Setiawan, 2015). Therefore, strengthening collaboration among stakeholders becomes essential. The pentahelix collaboration model, which involves the government, industry, academia, society, and mass media, is considered an important strategy to address workforce development challenges both nationally and internationally (Krisnanik et al., 2021).

Data from the Central Bureau of Statistics show that unemployment among vocational school graduates remains relatively high, despite the primary objective of vocational education being to produce job-ready graduates (Yoana, 2024). This paradox reflects a mismatch between the competencies possessed by graduates and the needs of the labor market. The issue occurs not only in formal vocational education institutions such as vocational schools but also in vocational training institutions such as *Balai Latihan Kerja* (BLK), *Balai Pelatihan Vokasi dan Produktivitas* (BPVP), and community training centers (Akhadi & Shofwan, 2024). These institutions are expected to strengthen the vocational education ecosystem in Indonesia (Indartha et al., 2025).

This phenomenon indicates the existence of a significant gap between educational outcomes and industrial needs. The discrepancy between what educational institutions produce and what industries require is commonly referred to as the “link and match gap” (Vandenberg & Laranjo, 2021). As a result, many graduates who are expected to be work-ready instead contribute to the unemployment rate because their competencies do not align with industry expectations (Suharno et al., 2020; Anshari & Almunawar, 2022; Zarkasih, 2018). Based on the background described above, identifying the key factors that contribute to the link and match gap between vocational education and training institutions and the labor market becomes an important research agenda. Therefore, this study aims to identify the key factors that cause the mismatch

between vocational education outputs and the needs of industry. The results of this research are expected to provide insights and strategic recommendations for policymakers in improving the quality of vocational education and preparing a competent and professional workforce in order to support Indonesia's vision of becoming a developed nation by its centennial independence in 2045.

The significance of this research lies in its contribution to the improvement of vocational education and training management in Indonesia. Specifically, this study is expected to provide a clearer understanding of the key factors that contribute to the mismatch between graduates of vocational education and training institutions and the needs of the labor market. The findings of this research will offer important insights into the underlying causes of the link and match gap between vocational education outputs and industry demands. By identifying these key factors, this study is expected to provide evidence-based information that can support the government and policymakers in formulating more effective strategies to strengthen the alignment between vocational education and labor market requirements.

Furthermore, the results of this research are expected to encourage stronger partnerships among stakeholders, particularly between vocational education institutions and industry. Such collaborations are essential for improving the competitiveness and employability of graduates so that they possess the competencies required by the labor market. In this context, partnerships should not merely serve as a symbolic or formal collaboration but must function as a strategic mechanism that enhances the relevance and effectiveness of vocational education and training. Therefore, vocational education institutions are expected not only to focus on increasing the quantity of student enrollment but also to prioritize the quality of educational outcomes and the long-term impact of their graduates. By strengthening institutional management, industry collaboration, and competency-based training systems, vocational education and training institutions can play a more significant role in preparing skilled and professional human resources capable of meeting the demands of an increasingly competitive global labor market.

METHODS

Research must be grounded in an appropriate philosophical paradigm, as the paradigm adopted by researchers influences how knowledge and social reality are interpreted and analyzed (Sobh & Perry, 2006). In this study, the research paradigm employed is interpretivism, which assumes that knowledge is constructed through the interpretation of social realities and human experiences (Kankam, 2019). Within this paradigm, the study adopts a hermeneutic perspective, which focuses on interpreting and synthesizing knowledge derived from relevant academic literature in order to understand complex social phenomena.

This research applies a Systematic Literature Review (SLR) approach combined with a meta-analysis perspective to examine and integrate findings from previous studies related to vocational education and training. The purpose of this approach is to identify and synthesize the key factors contributing to the link and match gap between vocational education and training institutions and the needs of the labor market. Through this approach, the study aims to develop a comprehensive understanding of the causes of the mismatch between vocational education outcomes and industry demands.

A literature review method was employed to analyze previous studies that examine vocational education and training systems in various countries. This approach allows researchers to critically review existing literature, evaluate previous findings, and synthesize relevant concepts in order to identify patterns and key determinants associated with the link and match gap. The analysis focuses on identifying studies that discuss factors influencing the alignment between vocational education outputs and labor market requirements. The literature search was conducted using five major academic databases, namely Scopus, ERIC, ResearchGate, ScienceDirect, and Google Scholar. These databases were selected because they contain a large number of reputable academic publications relevant to education, workforce development, and vocational training. In order to ensure the relevance and quality of the selected literature, inclusion and exclusion criteria were applied using the PICO framework (Population, Intervention, Comparison, and Outcome).

Table 1. PICO Criteria for Literature Selection

Criteria	Inclusions	Exclusion
Interventions	Factors related to the link and match gap	Studies unrelated to link and match gap factors
Populations	Vocational education and training institutions	Institutions outside vocational education and training
Study design	Qualitative, quantitative, and mixed-method studies	Studies that do not apply empirical research designs
Outcome	Key factors influencing the link and match gap in vocational education and training institutions	Outcomes unrelated to workforce alignment
Years of publication	2019-2024	Publications outside the specified year range
Language user	English and Indonesian	Languages other than English and Indonesian

To facilitate the management and organization of references, the Mendeley reference management software was used during the literature selection process. Mendeley assisted in organizing articles, removing duplicate records, and ensuring that only studies meeting the inclusion criteria were retained for further analysis. All selected articles were filtered based on relevance, credibility, and alignment with the research objectives (Arjanto et al., 2023). Through the systematic literature review process, the selected studies were analyzed to provide a critical evaluation and synthesis of the key ideas related to vocational education and workforce alignment. The SLR process in this research consists of several stages, namely: 1) formulating research questions; 2) identifying relevant articles from selected databases; 3) assessing the quality and relevance of the selected studies; 4) interpreting and synthesizing the findings to identify the key factors contributing to the link and match gap. The stages of the systematic literature review conducted in this study are illustrated in Figure 1, which describes the process of article identification, screening, eligibility assessment, and final inclusion of the selected studies.

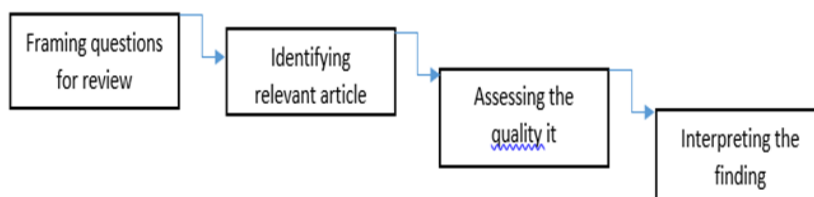


Figure 1. Steps of the Systematic Literature Review (SLR)

RESULTS AND DISCUSSION

Based on the initial literature search using the Publish or Perish application with the keywords “*Key Factors of the Link and Match Gap in Labour Education and Vocational Training in Indonesia*,” a total of 17,232 articles were initially identified. To narrow the scope of the study and ensure relevance to the research objectives, an advanced search strategy was applied using the following keyword combinations: (“*link and*

match gap” OR “job skills gap”) AND (“key factors” OR “contributing factors”) AND (“vocational education” OR “vocational training” OR “training centre”). The search was further limited to publications published between 2019 and 2023. After applying these criteria, the number of articles was reduced to 7,114 records. The detailed process of identifying and filtering the relevant articles is illustrated in Figure 2.

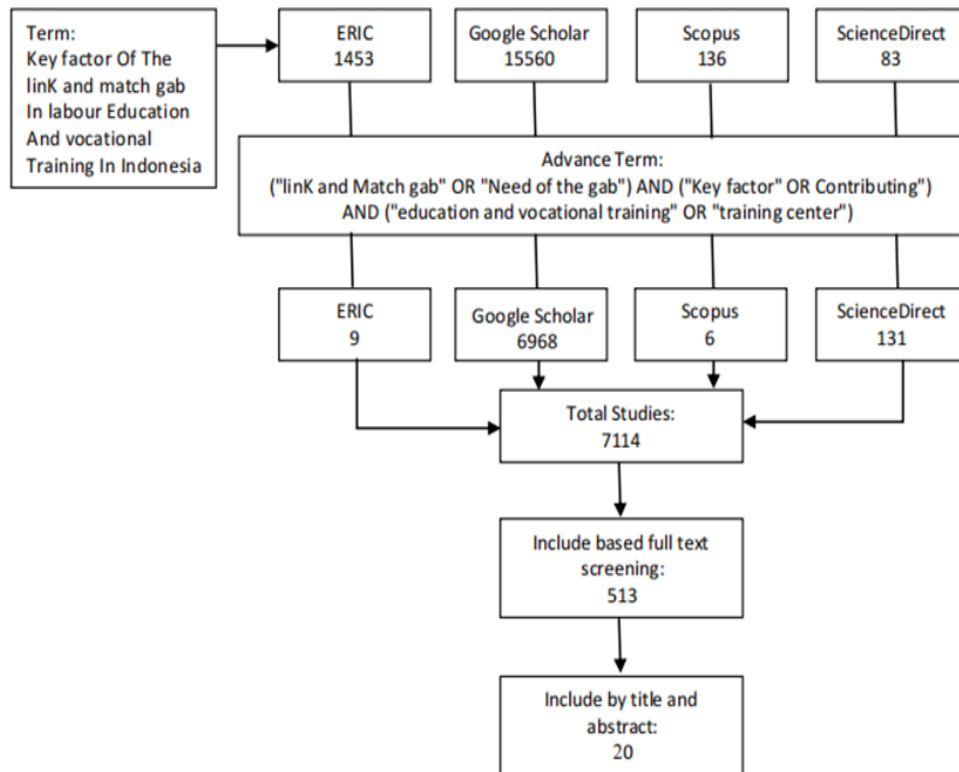


Figure 2. Process of searching and selecting relevant articles

Further filtering was conducted by limiting the search results to full-text articles, which reduced the number of eligible articles to 513 publications. Subsequently, a screening process was carried out by reviewing the titles and abstracts of the articles to determine their relevance to the research objectives. Articles that did not specifically address the issues related to the link and match gap in vocational education and training were excluded from further analysis.

After this screening process, a smaller set of articles that directly discussed the causes and contributing factors of the link-and-match gap was selected for in-depth analysis. These selected studies provided valuable insights into the structural and institutional factors contributing to the mismatch between vocational education outcomes and labor market need. The synthesis of the selected studies identified several key factors contributing to the link-and-match gap in vocational education and training institutions, including: *Curriculum Misalignment*, Many studies indicate that vocational curricula are often not fully aligned with the evolving skill demands of industries. This misalignment results in graduates possessing competencies that do not match the expectations of employers. *Limited Industry Partnerships*, Weak collaboration between vocational education institutions and industry stakeholders limits opportunities for curriculum development, internship programs, and work-based learning. As a result, training institutions struggle to provide industry-relevant competencies. *Mismatch in Competency Standards*, Several studies highlight the lack of harmonization between competency standards used by educational institutions and those required by the labor market. This discrepancy leads to graduates who meet academic standards but lack industry-recognized competencies. *Insufficient Soft Skills Development*, Vocational training programs tend to focus heavily on technical skills while paying less attention to essential employability skills such as communication, teamwork,

problem-solving, and adaptability. *Policy and Governance Challenges*, Fragmented regulatory frameworks and inconsistent government support have also been identified as factors contributing to the gap. Ineffective coordination between policy makers, educational institutions, and industry actors often hampers the implementation of integrated workforce development strategies.

Overall, the findings indicate that the link-and-match gap in vocational education and training is a multidimensional issue involving institutional, structural, and policy-related factors. Addressing this challenge requires comprehensive strategies that strengthen collaboration between vocational education institutions and industry, improve curriculum relevance, and ensure that graduate competencies align more closely with labor market demands.

Vocational Education and Training Institutions in Indonesia

Vocational education and training (VET) institutions play a strategic role in Indonesia's education system, particularly in preparing human resources who possess professional competencies and are ready to enter the labor market (Ferkasa, 2022). These institutions are designed to equip learners with practical skills and technical knowledge that support workforce productivity and national economic development. The demand for vocational education and training institutions is influenced by several factors, including the availability of facilities, institutional reputation, geographic accessibility, and the professional competence of instructors and training staff (Helmy, 2014).

In the context of Indonesia's long-term development agenda, particularly the vision of Golden Indonesia 2045, strengthening the quality of human resources has become a national priority. Vocational education and training institutions therefore play a critical role in preparing a skilled workforce capable of competing at both national and global levels. According to Law No. 20 of 2003 concerning the National Education System, vocational education in Indonesia is categorized into two main pathways: formal vocational education and vocational training systems.

Formal vocational education includes Vocational High Schools at the secondary level and vocational higher education institutions, such as polytechnics, applied universities, and professional colleges. As of recent data, Indonesia has approximately 14,266 vocational high schools, which aim to prepare students with practical competencies aligned with specific occupational fields. At the higher education level, vocational programs offer diploma qualifications ranging from D1, D2, and D3 (associate expert levels) to D4 (applied undergraduate programs), which focus on the application of science and technology in professional contexts (Jono, 2016). Figure 3 illustrates the structure of vocational education and training levels within the Indonesian education system.

The second pathway consists of vocational training institutions designed to improve workforce readiness and skill development. These include Vocational Training Centers (BLK), Private Training Institutions (LPK), and Community Vocational Training Centers (BLKK). The implementation of vocational training in Indonesia is regulated under Law No. 13 of 2003 on Manpower, Government Regulation No. 31 of 2006, and Minister of Manpower Regulation No. 17 of 2019, which collectively form the foundation of the national vocational training system. These vocational training programs are managed by the Ministry of Manpower and are intended to enhance workforce competencies in response to labor market needs. By 2023, the Indonesian government had established approximately 3,757 Community Vocational Training Centers (BLKK) across the country, with plans for continued expansion in order to strengthen workforce readiness and skill development.

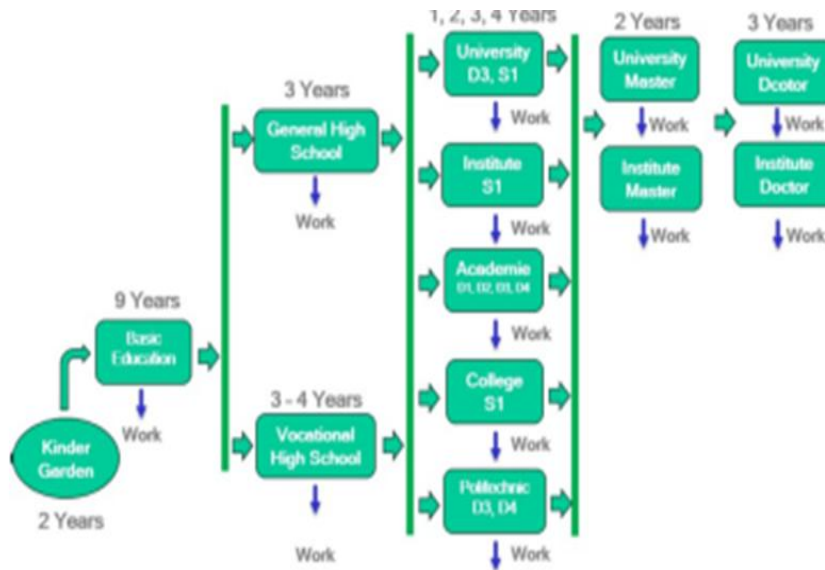


Figure 3. Levels of education and vocational training in Indonesia

Synergizing The Relationship Between Vocational Education And Industry

The rapid transformation of the labor market driven by globalization and the Industrial Revolution 4.0 has significantly altered the competencies required by employers. As a result, vocational education and training institutions must continuously evaluate and update their programs to ensure alignment with industry needs (Irfan, 2020). However, previous studies have highlighted a persistent gap between the competencies possessed by graduates and the actual skills required in the workplace. Although vocational education institutions are expected to produce work-ready graduates, many employers report that graduates often lack the competencies necessary to meet industry demands. This situation reflects a structural challenge in the alignment between educational outputs and labor market expectations.

For Indonesia, developing a workforce with strong competencies and professional expertise is essential for sustaining economic growth and industrial development. Therefore, revitalizing the vocational education and training system has become an urgent priority for the government in order to ensure that educational institutions are capable of producing graduates who meet the evolving needs of the labor market. Figure 4 illustrates the conceptual relationship between vocational education and training institutions and the labor market.

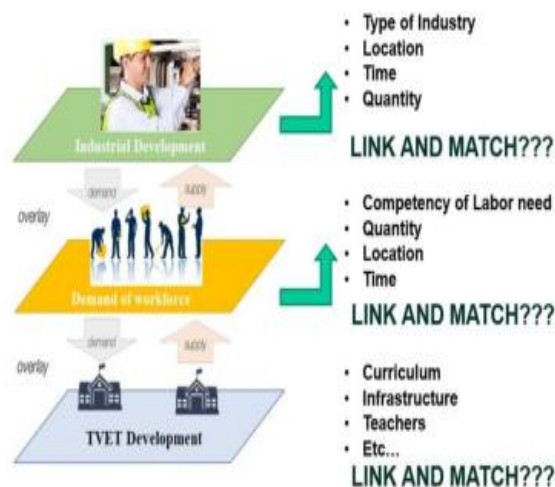


Figure 4. Integration of vocational education and training with the labor market

The concept of link and match emphasizes the importance of strong alignment between vocational education institutions and their industry partners. Effective collaboration between these stakeholders is essential for ensuring that learning processes, training programs, and competency development reflect the real demands of the workplace. Through such collaboration, vocational education institutions can design more relevant curricula and learning experiences that enhance graduate employability.

Nevertheless, in practice, a significant gap often exists between educational outcomes and labor market needs. Many graduates from vocational education and training institutions possess competencies that do not fully align with industry expectations, leading to difficulties in securing employment. This mismatch represents the link-and-match gap, which arises when educational outputs fail to meet the quality, quantity, location, and timing requirements of the labor market. The government plays a critical role as a regulator in ensuring that these four aspects quality, quantity, location, and timing of workforce supply are aligned with national workforce development needs. Effective policy coordination and regulatory frameworks are therefore essential for reducing the mismatch between vocational education outcomes and labor market demands.

Key Factors Influencing the Link-and-Match Gap

Based on the synthesis of literature reviewed in this study, several key factors contribute to the link-and-match gap between vocational education and training institutions and their graduate user partners. *Policy Framework*, A strong policy framework is required to ensure that vocational education institutions are systematically aligned with industry needs. Clear regulatory support can provide a solid foundation for establishing sustainable partnerships between education providers and industry stakeholders., *Strategic Institutional Management*. Effective strategies are required to implement link-and-match initiatives between educational institutions and industry. These strategies should facilitate continuous communication and collaboration between stakeholders in order to ensure mutual understanding of workforce needs. *Curriculum Relevance*.

Curriculum design plays a central role in preparing graduates with relevant competencies. Vocational curricula must be continuously updated to reflect technological advancements and industry developments. Importantly, industry partners should be actively involved in curriculum development to ensure that the skills taught in training institutions correspond to labor market demands. *Learning and Teaching Approaches*. Vocational education institutions must adopt flexible and innovative learning approaches that accommodate diverse learner characteristics. Approaches such as blended learning, e-learning, and project-based learning have been shown to improve learning outcomes and better simulate real work environments (Wahjono et al., 2021; Sudjimat, 2016). *Industry Partnerships*, Strong partnerships between vocational education institutions and industry actors are essential for improving graduate employability. Collaborative initiatives may include joint curriculum development, industrial internships, guest lectures from industry experts, training workshops, and professional instructor development programs. *Accreditation and Quality Assurance*, Accreditation plays an important role as an external quality assurance mechanism that ensures educational programs meet national standards and industry requirements. High accreditation status can also strengthen public trust and institutional credibility. *Financial Management*, Adequate financial resources are essential for maintaining high-quality vocational education programs. Effective financial management allows institutions to invest in infrastructure, training equipment, certification programs, and other resources necessary for improving learning quality. *Instructor Competence*, Instructor quality is a key determinant of training effectiveness. Instructors must possess both theoretical knowledge and practical industry experience in order to deliver relevant and effective training programs (Rasyad et al., 2019).

Continuous professional development for instructors is therefore crucial. *Institutional Culture and Work Ethics*, Vocational education institutions must cultivate workplace values such as discipline, integrity, teamwork, and occupational safety awareness. These soft skills are essential for improving graduates' adaptability and professional behavior in real work environments (Alfianto et al., 2019). *Infrastructure and*

Training Facilities, The availability of modern training facilities and equipment is critical for providing realistic learning experiences. Many vocational institutions still rely on outdated equipment that does not reflect current industry technology (Larasati et al., 2014). Improving infrastructure can significantly enhance graduate competency development..

Strengthening Multi-Stakeholder Collaboration

In order to address the link-and-match gap, vocational education and training institutions must adopt a collaborative approach involving multiple stakeholders. One potential strategy is the pentahelix collaboration model, which integrates the roles of government, academia, industry, society, and media (Rizkiyah et al., 2019). Through this model, government institutions can provide regulatory frameworks and financial support, academic institutions can contribute research and innovation, industry partners can provide practical insights and employment opportunities, communities can strengthen social support systems, and media can enhance information dissemination and institutional visibility.

Furthermore, vocational education institutions should establish mechanisms to continuously monitor labor market trends and identify emerging skill demands. Since industry needs evolve rapidly alongside technological advancements, workforce planning must be adaptive and responsive. Ultimately, strengthening collaboration between vocational education institutions and industry stakeholders is essential for producing graduates who possess relevant competencies, professional skills, and strong employability in an increasingly competitive labor market.

CONCLUSION

This study examined the key factors contributing to the link-and-match gap between vocational education and training institutions and the needs of the labor market in Indonesia. The findings indicate that, although vocational education and training institutions in Indonesia have developed significantly and maintain various forms of collaboration with industry partners, a substantial gap between graduate competencies and labor market demands still persists. The results of this study identify ten key factors that influence the effectiveness of link-and-match implementation between vocational education institutions and industry. These factors include: (1) supportive policy frameworks, (2) adaptive institutional strategies, (3) industry-involved curriculum development, (4) relevant and flexible learning methods, (5) strong multi-stakeholder partnerships, (6) accreditation and quality assurance mechanisms, (7) effective financial management, (8) institutional quality management, (9) the improvement of instructor competence, (10) the development of work culture and academic atmosphere, and (11) the availability of adequate facilities and infrastructure that reflect real industry conditions. The findings also emphasize the importance of strengthening collaborative partnerships among multiple stakeholders through the pentahelix model, which integrates the roles of government, academia, industry, society, and media. Such collaboration can help vocational education and training institutions respond more effectively to the dynamic needs of the labor market, which continue to evolve alongside advances in science and technology. In addition, establishing a dedicated organizational coordination forum that continuously monitors workforce demand, industry trends, and emerging skill requirements could help reduce the mismatch between educational outputs and labor market needs. Through stronger coordination and strategic partnerships, vocational education institutions can produce graduates who are more competitive and better prepared to meet industry expectations. Finally, future research is recommended to develop and test contextual partnership models that consider the cultural, economic, and industrial characteristics of different regions in Indonesia. Such research could contribute to improving the effectiveness of the link-and-match system between vocational education institutions and the labor market, ultimately helping to reduce educated unemployment and enhance the competitiveness of Indonesia's workforce.

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