Paidea :
Jurnal Pendidikan dan Pembelajaran Indonesia
2026, 6(1), 36-45
https://doi.org/10.56393/paidea.v6i1.4637

Institutional Readiness of Vocational High Schools for Industry-Oriented Employment in Maluku Province

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Article History
Received: 16 July 2026;
Revised : 24 July 2026;
Accepted: 22 November 2026.

Keywords
Vocational Education;
Institutional Readiness;
TVET;
Industry Partnership;
Teaching Factory.

Abstract
Vocational education in archipelagic regions faces persistent challenges related to geographical fragmentation, unequal access to industrial resources, infrastructure disparities, and workforce development. This study analyzes the institutional readiness of vocational high schools in Maluku Province to support industry-oriented employment through a systematic literature review. Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, records were identified, of which studies met the inclusion criteria for qualitative synthesis. The findings indicate that institutional readiness remains at a Moderate level across five dimensions: curriculum relevance, human resources, infrastructure, industry partnerships, and Teaching Factory implementation. Vocational schools have established essential institutional components for industry-oriented education, but implementation remains uneven due to organizational, geographical, financial, and collaborative constraints. Based on thematic convergence, this study proposes the Archipelagic Industry-Oriented TVET Readiness Framework, which conceptualizes institutional readiness through the interaction of collaborative TVET governance, institutional capacity, and archipelagic geographical characteristics. The findings highlight the need for integrated policies focusing on continuous curriculum renewal, teacher industrial attachment, infrastructure modernization, sustainable industry partnerships, and Teaching Factory development to strengthen graduate employability and support regional economic development.

Contact : Corresponding author e-mail: akerina23@gmail.com
How to Cite : Akerina, W. A. A. (2026). Institutional Readiness of Vocational High Schools for Industry-Oriented Employment in Maluku Province. *Paidea : Jurnal Pendidikan Dan Pembelajaran Indonesia*, *6*(1), 36–48. https://doi.org/10.56393/paidea.v6i1.4637

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Introduction

Technical and Vocational Education and Training (TVET) plays a strategic role in preparing a skilled workforce capable of responding to Industry 4.0, Society 5.0, and rapid digital transformation. The adoption of technologies such as artificial intelligence (AI), automation, big data, and the Internet of Things (IoT) has significantly changed labor market demands, requiring workers to possess not only technical competencies but also adaptable employability skills (Daryono & Achmadi, 2025; Nurjanah et al., 2022; OECD, 2023; UNESCO, 2021). The Future of Jobs Report 2025 projects that 170 million new jobs will emerge by 2030, while approximately 39% of workers will require reskilling or upskilling (World Economic Forum, 2025). Consequently, strengthening institutional readiness within vocational education has become essential for developing graduates who remain competitive, resilient, and capable of supporting sustainable economic development (International Labour Organization, 2024; UNESCO, 2021).

In Indonesia, vocational education has been prioritized through the Vocational High School Revitalization Program and the Link and Match policy, which seek to align vocational education with the needs of business and industry (Dunia Usaha dan Dunia Industri/DUDI) (Kana & Letaba, 2024; Ministry of Education Culture & Technology, 2023). These initiatives promote curriculum transformation, competency-based learning, Teaching Factory implementation, industry collaboration, internships, competency certification, and graduate recruitment (Rifai et al., 2025). Nevertheless, vocational high school graduates continue to record one of the highest unemployment rates in the country, reflecting persistent skills mismatches, limited industrial exposure, inadequate facilities, and insufficient curriculum synchronization with rapidly evolving technologies (Badan Pusat Statistik, 2025; Harianto et al., 2024; OECD, 2023; UNESCO, 2021). These challenges indicate that improving graduate employability requires strengthening institutional capacity rather than focusing solely on students' individual competencies (Daryono & Achmadi, 2025).

Institutional readiness refers to the capacity of vocational education institutions to respond effectively to industrial, technological, and policy changes. According to Weiner (2009), organizational readiness reflects the shared commitment and collective capability required to implement change successfully, while institutional theory emphasizes organizational adaptation to external expectations and labor market demands (Scott, 2014). Within TVET, institutional readiness encompasses adaptive curricula, competent human resources, adequate infrastructure, effective governance, and sustainable partnerships with industry that collectively support graduate employability (Daryono & Achmadi, 2025; OECD, 2023; Putra et al., 2025; UNESCO, 2021). Previous studies have likewise demonstrated that graduate quality is shaped by comprehensive institutional preparedness rather than individual competence alone (Abelha et al., 2020; OECD, 2023; Scandurra et al., 2024; World Bank, 2019).

These issues are particularly evident in Maluku Province, an archipelagic region of more than 1,300 islands where geographical fragmentation creates disparities in educational access, infrastructure, teacher distribution, and collaboration with industry (Badan Pusat Statistik, 2025). Vocational schools in remote islands frequently encounter limited industrial partners,

logistical barriers, inadequate laboratories, and restricted opportunities for industrial internships, making curriculum synchronization and Teaching Factory implementation more difficult (OECD, 2023; UNESCO, 2021; World Bank, 2019). Given that Maluku's economy relies heavily on fisheries, agriculture, tourism, and emerging service sectors, strengthening institutional readiness is crucial to ensure vocational education supports regional economic development and responds effectively to labor market needs.

Although previous studies have shown that industrial internships, work-based learning, vocational competencies, digital literacy, and employability skills improve graduates' work readiness (Aini & Wulandari, 2024; Ameliyah & Fitriana, 2022; Daryono & Achmadi, 2025; Prayoga, 2025; Putra et al., 2025; Ratnasari & Mudrikah, 2025; Tsaqib et al., 2025), they predominantly examine employability from the perspective of individual students. Limited attention has been given to institutional dimensions such as governance, curriculum responsiveness, teacher capacity, infrastructure, Teaching Factory implementation, and sustainable industry collaboration, particularly in geographically dispersed regions such as Maluku (Putra et al., 2025; Rifai et al., 2025). As a result, empirical evidence remains insufficient regarding how institutional capacity collectively determines vocational schools' ability to respond to labor market demands in archipelagic contexts.

Accordingly, this study analyzes the institutional readiness of vocational high schools in Maluku Province by examining governance, curriculum relevance, human resources, infrastructure, Teaching Factory implementation, and collaboration with business and industry (Dunia Usaha dan Dunia Industri/DUDI). By shifting the analytical focus from individual employability to institutional capacity, this study extends vocational education literature through the integration of Organizational Readiness Theory and institutional theory within an archipelagic context. The findings provide both theoretical contributions to the understanding of institutional readiness and practical evidence to assist policymakers, vocational school leaders, and industry in strengthening school–industry collaboration and developing adaptive, industry-oriented vocational education systems that support regional economic development.

Method

This study employed a qualitative systematic literature review (SLR) following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Creswell & Creswell, 2018; Page et al., 2021). Secondary data were retrieved from peer-reviewed journal articles, international confersence proceedings, academic books, and book chapters indexed in Scopus, Web of Science, ScienceDirect, SpringerLink, and Google Scholar. The literature search used predefined Boolean search strings combining terms related to vocational education, institutional readiness, industry collaboration, Teaching Factory, employability, and work readiness, with database-specific adaptations and filters (Page et al., 2021). Publications from 2015–2025 were screened using predefined inclusion and exclusion criteria, including publication period, peer-review status, language, topical relevance, full-text availability, and duplication (Xiao & Watson, 2019). Selected studies were subjected to a quality assessment based on five criteria covering relevance, research objectives, methodological appropriateness,

transparency of findings, and contribution to the review, with studies scoring at least four out of five retained for synthesis (Kitchenham & Charters, 2007; Xiao & Watson, 2019). Following the PRISMA workflow, studies proceeded through identification, screening, eligibility, and inclusion stages (Page et al., 2021). The final studies were coded across five analytical dimensions: curriculum relevance, human resources, infrastructure, industry partnership, and Teaching Factory implementation (Schreier, 2012). Thematic analysis was then conducted to synthesize recurring evidence and determine institutional readiness levels based on thematic convergence, using an operational rubric adapted from Organizational Readiness Theory (Weiner, 2009). The findings were synthesized into broader themes to determine the overall institutional readiness across the five dimensions (Braun & Clarke, 2021; Schreier, 2012).

Results and Discussion

Results

The institutional readiness of vocational high schools in Maluku Province was synthesized through five analytical dimensions: curriculum relevance, human resources, infrastructure, industry partnership, and Teaching Factory implementation. The findings were organized into an analytical matrix that presents each dimension according to its sub-indicators, synthesized evidence, and readiness level, providing a transparent basis for interpretation (Schreier, 2012). This approach also clarifies the rationale underlying each readiness classification (Braun & Clarke, 2021). Across all reviewed studies, none of the dimensions reached a High level of readiness. Instead, every dimension was consistently categorized as Moderate, indicating that institutional development has progressed but remains uneven across vocational schools and geographical contexts (Weiner, 2009). This classification reflects thematic convergence across the reviewed literature rather than quantitative scoring (Braun & Clarke, 2021).

Curriculum readiness has improved through the implementation of the Link and Match policy, with many vocational schools aligning their curricula to regional industrial sectors such as fisheries, agribusiness, tourism, and marine resources. However, curriculum evaluation and competency updates remain inconsistent, resulting in a continued mismatch between graduates' skills and industry needs. Likewise, human resource readiness is still categorized as Moderate because opportunities for teacher training, industrial attachment, and professional certification remain constrained by limited funding, industrial access, and the geographical conditions of Maluku Province. These limitations are particularly evident in remote island schools, highlighting the need for continuous curriculum improvement and sustained teacher development (Aini & Wulandari, 2024; OECD, 2023; Ratnasari & Mudrikah, 2025; Yoto et al., 2024).

Table 1 summarizes the analytical matrix used to assess the institutional readiness of vocational high schools in Maluku Province across five dimensions: curriculum relevance, human resources, infrastructure, industry partnership, and Teaching Factory implementation. The matrix presents key sub-indicators, synthesized findings, and overall readiness levels based on thematic convergence in the reviewed literature.

Table 1. Analytical Matrix of Institutional Readiness of Vocational High Schools in Maluku Province

Dimension	Sub-indicators	Synthesized Findings	Readiness Level
Curriculum	Curriculum synchronization with DUDI; competency updating; regional industrial relevance; curriculum review	Most studies indicate that curriculum synchronization has been initiated and aligned with priority regional sectors such as fisheries, marine resources, agribusiness, and tourism. Nevertheless, curriculum reviews are not conducted consistently, resulting in delays in adapting competencies to technological developments and industrial needs.	Moderate
Human Resources	Teacher qualifications; pedagogical upskilling; industrial reskilling; professional certification; industrial internships	Teachers generally possess qualifications consistent with their vocational specialization. However, opportunities for pedagogical upskilling, industrial reskilling, competency certification, and industrial internships remain limited because of funding constraints, geographical barriers, and restricted industrial collaboration.	Moderate
Infrastructure	Laboratories; workshops; industrial equipment; learning facilities; technology accessibility	Practical facilities are available in most vocational schools but remain unevenly distributed between urban and outer-island schools. Many laboratories require modernization to better reflect current industrial technologies and workplace standards.	Moderate
Industry Partnership	Student internships; curriculum development; competency certification; graduate recruitment; teacher training	Partnerships with business and industry have been established primarily through internships and competency certification. However, long-term collaboration involving curriculum development, teacher capacity building, and continuous institutional evaluation remains limited.	Moderate
Teaching Factory	Production-based learning; industrial mentoring; production facilities; operational support; entrepreneurship	Teaching Factory has been implemented in several vocational schools but remains limited to particular schools and vocational programs. Constraints related to production facilities, operational funding, industrial mentoring, and product marketing continue to affect implementation consistency.	Moderate

Infrastructure readiness also falls within the Moderate category. Although most schools have laboratories and workshops to support competency-based learning, the quality and technological relevance of these facilities differ considerably. Schools in remote areas continue to face greater challenges in equipment maintenance, transportation, and access to modern technology than those located in urban centers (OECD, 2023; UNESCO, 2021).

Industry partnerships have expanded through internships, curriculum synchronization, competency certification, and graduate recruitment, demonstrating progress in implementing the Link and Match policy. Nevertheless, collaboration remains largely operational and has not yet developed into long-term partnerships involving curriculum co-development, teacher industrial attachment, or institutional evaluation. This indicates that stronger and more sustainable cooperation with industry is still required (OECD, 2023; Yoto et al., 2024).

Teaching Factory implementation has also progressed as an industry-based learning approach that combines classroom instruction with real workplace experience. However, its implementation is still limited because it depends on adequate facilities, funding, industrial mentoring, and institutional capacity. Existing studies mainly emphasize its contribution to students' competencies rather than its long-term operational sustainability. Therefore, this dimension is likewise classified as Moderate, suggesting that greater institutional support and stronger industry collaboration are needed to optimize its implementation (Harianto et al., 2024; OECD, 2023; Yoto et al., 2024).

Overall, the synthesis indicates that institutional readiness in vocational high schools across Maluku Province is shaped by five interconnected dimensions: curriculum relevance, human resources, infrastructure, industry partnerships, and Teaching Factory implementation. Although these areas have improved, progress remains uneven because of differences in organizational capacity, funding, industrial access, and geographical conditions. Consequently, institutional readiness is classified as Moderate, indicating that the basic foundations are in place but further policy support, stronger industry collaboration, and sustained institutional development are needed to address existing challenges (OECD, 2023; Weiner, 2009).

Discussion

The findings indicate that vocational high schools in Maluku Province demonstrate a Moderate level of institutional readiness, suggesting that the key components of industry-oriented TVET have been established but are not yet fully integrated. According to Organizational Readiness Theory, institutional readiness reflects an organization's commitment and collective capability to implement change (Weiner, 2009). In this study, readiness is represented by five interconnected dimensions: curriculum relevance, human resources, infrastructure, industry partnerships, and Teaching Factory implementation. These dimensions collectively shape institutional effectiveness rather than functioning independently. In addition, Human Capital Theory emphasizes that strengthening teacher competencies and continuous professional development is essential for improving graduate employability and institutional performance (Becker, 1993). The findings also reinforce the importance of collaborative TVET governance, where government, schools, industry, and local communities jointly support sustainable vocational education (OECD, 2023; UNESCO, 2021).

These results are consistent with previous studies conducted in other archipelagic and developing regions, where institutional readiness remains constrained by geographical fragmentation, uneven industrial development, limited infrastructure, and restricted opportunities for teacher development. Similar conditions have been reported in the Philippines, Malaysia, and several Small Island Developing States (SIDS), indicating that regional socioeconomic and geographical contexts strongly influence the implementation of vocational education. In Maluku Province, these structural challenges contribute to uneven progress in curriculum development, infrastructure modernization, and industry collaboration. Compared with earlier studies that mainly focus on employability or work-based learning, this review provides a broader perspective by positioning institutional readiness as the foundation of sustainable TVET development.

Based on the literature synthesis, this study proposes the Archipelagic Industry-Oriented TVET Readiness Framework, which conceptualizes institutional readiness as an integrated ecosystem. The framework consists of five interconnected dimensions, curriculum relevance, human resources, infrastructure, industry partnerships, and Teaching Factory implementation, that collectively support industry-oriented learning. A distinctive feature of the framework is the inclusion of the archipelagic context as a structural factor influencing institutional capacity, while collaborative TVET governance connects government, schools, industry, certification bodies, and local communities to strengthen regional vocational education.

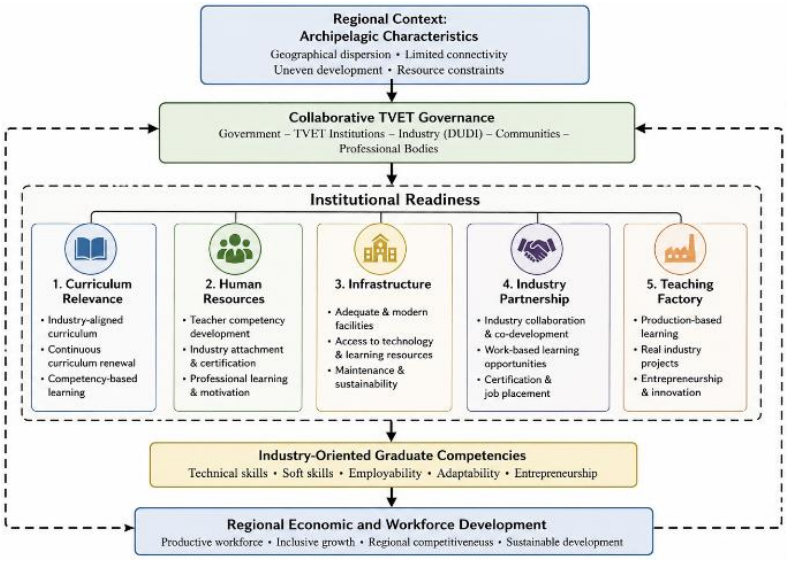


Figure 1. Proposed Archipelagic Industry-Oriented TVET Readiness Framework

As illustrated in Figure 1, the framework shows that geographical characteristics influence institutional readiness through collaborative governance. The interaction among the five dimensions supports the development of industry-oriented competencies, ultimately contributing to workforce quality and regional economic development. By integrating Organizational Readiness Theory, Human Capital Theory, and collaborative TVET governance, the framework offers a more comprehensive perspective than previous studies, which often examine curriculum, employability, or school–industry collaboration separately. Although still

conceptual, it provides a useful basis for future empirical validation across different vocational education contexts.

The findings also highlight several practical implications. Vocational schools should prioritize continuous curriculum improvement, teacher professional development, infrastructure modernization, wider Teaching Factory implementation, and stronger long-term industry partnerships. At the policy level, TVET strategies need to better address regional disparities by improving resource allocation, expanding digital infrastructure, and strengthening institutional coordination. Future research is encouraged to empirically validate the proposed framework using quantitative, qualitative, or mixed-method approaches in other archipelagic regions. Overall, sustainable TVET development depends on integrating institutional capacity, collaborative governance, human capital development, and regional characteristics into a coherent educational ecosystem.

Conclusion

This systematic literature review concludes that the institutional readiness of vocational high schools in Maluku Province remains at a moderate level, indicating that essential components for industry-oriented vocational education have been established but are not yet implemented consistently and synergistically across institutions. The findings demonstrate that curriculum relevance, human resource capacity, infrastructure adequacy, industry partnerships, and Teaching Factory implementation constitute interdependent dimensions of institutional readiness and provide the basis for the proposed Archipelagic Industry-Oriented TVET Readiness Framework, which positions collaborative governance, institutional capacity, and archipelagic geographical characteristics as interconnected determinants of readiness. The findings imply that policymakers and vocational school leaders should implement context-responsive strategies by strengthening curriculum–industry alignment, teacher industrial attachment and competency certification, vocational infrastructure, sustainable industry partnerships, and Teaching Factory implementation to enhance graduate employability and support regional economic development. However, the framework remains conceptual because the study relies on evidence synthesized from published literature and has not yet been empirically validated. Future research should therefore test and refine the framework through case studies, surveys, interviews, or mixed-method approaches involving vocational schools and key stakeholders across Maluku and other archipelagic regions.

Acknowledgments

The author would like to express sincere gratitude to Universitas Pattimura for providing academic support throughout this study. Appreciation is also extended to fellow colleagues and researchers whose valuable discussions and constructive feedback contributed to the development of this manuscript. Finally, the author acknowledges all scholars whose published works served as important references for this literature review.

Authors' Note

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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