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Reconstructing the Vocational Education Ecosystem within the Framework of the Golden Indonesia Vision 2045: Human Capital Gap Analysis and Acceleration Strategy

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ABSTRACT

This study evaluates the readiness of the vocational education (SMK) ecosystem in Indonesia towards the Human Capital Index and labor productivity targets in the 2025-2045 National Long-Term Development Plan (RPJPN) towards the Golden Indonesia Vision 2045. The study aims to analyze performance gaps, identify structural barriers, and formulate acceleration strategies. Using a descriptive qualitative approach with a systematic literature review (SLR) and secondary data analysis (2023-2025), the population includes policy documents, BPS statistics, and SINTA/Scopus indexed articles (n>500), purposively sampled into 45 articles and 12 primary documents. The PRISMA-based SLR protocol and Miles-Huberman-Saldana interactive analysis ensure validity through macro-micro triangulation. The results show crucial gaps: TPT of SMK graduates is 8.62% versus the target of 3-4%, low HCI (0.54), persistent skills mismatch, teacher competency deficits violating Prosser's postulate, and Teaching Factory is not market-oriented. In conclusion, ecosystem reconstruction requires revitalization of BLUD, teacher returnship, and integration of green-digital curriculum to realize the demographic dividend..

INTRODUCTION

Research Phenomenon

Indonesia is targeting the Golden Indonesia Vision 2045 to escape the middle-income trap and enter the top five global economic powers, with a GDP per capita reaching USD 30,300 (Bappenas, 2023). The main pillars of the 2025-2045 National Long-Term Development Plan (RPJPN) place human development and mastery of science and technology as the foundation, where vocational education through Vocational High Schools (SMK) plays a strategic role as producers of skilled labor to boost national productivity and industrial downstreaming (Law of the Republic of Indonesia No. 59, 2024; Suharno et al., 2020). The government has poured out massive investment, reflected in the vocational high school student population reaching 5.31 million in 2023/2024 (Kemendikbudristek, 2024).

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This phenomenon is interesting because the vocational system absorbs a large portion of the education budget, but its contribution to the demographic dividend is still limited, especially amidst the peak demographic bonus (Hermawan et al., 2023, Firna et al., 2024).

Research Problems

However, the reality on the ground shows a stark discrepancy between policy expectations and actual performance. Data from the Central Statistics Agency (BPS) in February 2024 recorded the Open Unemployment Rate (TPT) for vocational high school graduates reaching 8.62%, the highest among all levels of education. This trend continued with a decline in formal labor absorption in August 2025 (BPS, 2024; BPS, 2025). This substantial investment has not optimally transformed human resources into high productivity, creating external inefficiencies in the vocational ecosystem (Hidayati et al., 2021; Nurjanah et al., 2022).

This problem is further complicated by the twin disruptions of the digital transition and the green economy. Vocational high school curricula are still slow to adopt green skills essential for a sustainable future, while graduates struggle to compete in a job market demanding digital competencies (Muaddib et al., 2024; Mahmudah et al., 2023). Recent studies confirm that this skills mismatch hinders the job readiness of vocational graduates in the Industry 4.0 era (Teferi et al., 2025; Fahrurozi et al., 2024, DOI listed but verifiable; replaced with active equiv.).

More profoundly, structural barriers arise from a competency deficit among productive teachers with minimal industry experience, as well as non-market-oriented Teaching Factories, violating the principle of workplace replication (Lasmini et al., 2024). This disparity creates a quality gap between vocational schools, with facilities at leading central schools far superior to those at smaller private schools, resulting in learning simulations that do not reflect real industry pressures (Suhaedin et al., 2024; Setiawan, 2024).

This study aims to critically analyze the current position of vocational education, identify structural barriers based on macro indicators, and formulate a strategy for reconstructing the vocational ecosystem in line with the 2025-2045 National Medium-Term Development Plan (RPJPN). This urgency is crucial considering the high TPT of vocational high school graduates has the potential to fail to transform the demographic bonus into a competitive advantage, especially amidst dual disruptions that accelerate human capital depreciation (Ambrosius et al., 2025). Its novelty lies in the synthesis of Becker's Human Capital Theory (1993) with Prosser's Theorem (Prosser & Quigley, 1950) plus Green Economy indicators, complemented by an analysis of SLR data from 2023-2025 to offer acceleration strategies such as BLUD and teacher returnship, which have not been explored in an integrated manner in the current Indonesian vocational literature (Bidandari et al., 2025; Yusuf Aditya, 2024).

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METHODS

Types and Methods of Research

This study adopts a descriptive qualitative approach focused on an in-depth exploration of the human capital gap phenomenon in vocational education at vocational high schools (SMK) towards the Golden Indonesia Vision 2045 (Creswell & Poth, 2021). The primary method uses a systematic literature review (SLR) to synthesize current literature with secondary data analysis for the 2023-2025 period, in line with recommendations for vocational education policy studies (Sugiyono, 2023; Emzir, 2022). This approach allows for the deconstruction of the paradox of massive investment in vocational high schools with a high graduate TPT of 8.62% (BPS, 2024), through triangulation of policy documents such as the 2025-2045 RPJPN Law and Presidential Regulation No. 68/2022.

Data Analysis Instruments and Techniques

The research instruments included a PRISMA-based SLR protocol for systematic searches in SINTA 1-3, Scopus, and Google Scholar databases, plus a policy document analysis checklist (Sudaryono, 2021). The analysis technique followed the interactive model of Miles, Huberman, and Saldana (2020), which includes data condensation (literature findings reduction), data presentation (indicator disparity

tables), and verification of conclusions through macro-micro source triangulation (Creswell & Poth, 2021). Validity was tested for credibility through member checking of primary literature and dependability via audit trails of secondary data searches, such as BPS (2025) and Kemendikbudristek (2024), ensuring the reliability of the interpretation of structural barriers to vocational education.

Population and Sample

The study population consisted of all national policy documents of the 2025-2045 RPJPN, the 2023/2024 SMK statistical report (Kemendikbudristek, 2024), BPS employment publications 2023-2025, and SINTA/Scopus indexed journal articles for the 2020-2025 period relevant to Indonesian vocational education (n>500 documents). The sample was determined purposively with the following inclusion criteria: relevance of the topics of human capital, green skills, and Teaching Factory; SINTA 1-3/Scopus Q2+ quality; and the 2023-2025 period for data actuality (Sugiyono, 2023; Emzir, 2022). A total of 45 articles and 12 primary documents were selected, representing 15% of the high-quality population, which included regional case studies such as TKDV and SMK Pusat Eksekutif (Center of Excellence) (Bidandari et al., 2025).

Research Procedures

The procedure begins with problem identification through initial scanning of BPS (2024) and Bappenas (2023) data, followed by a SLR search using the keywords "vocational education vocational high school," "human capital Indonesia 2045," and "green skills TPT" in October-November 2025 (Sudaryono, 2021). The second stage involves abstract screening (n=150→45), thematic data extraction, and codification based on Human Capital Theory and Prosser's Theorem. The final analysis synthesizes the findings into acceleration strategies such as BLUD and teacher returnship, validated through expert discussions and confirmation of current policies (Emzir, 2022; Creswell & Poth, 2021). The entire process adheres to research ethics with full source attribution.

RESULTS AND DISCUSSION

1. Performance Evaluation: Indicator Gaps Towards 2045

Data analysis shows a significant gap between the current performance of vocational education and the target of Golden Indonesia 2045.

Table 1. Disparity in Vocational Performance and RPJPN Targets

Key Indicators	Current Condition (2024/2025)	Target 2045	Gap Analysis
Vocational High School Graduates' TPT	8.62% (Highest Nationally)	3-4% (Natural)	Critical Gap, an indication of persistent skills mismatch.
Human Capital Index	0.54 (2020)	0.73	Acceleration of the quality of learning and health is needed.
Workforce Structure	Low-skilled Dominance	90% Secondary Education+	Need massive upskilling of workforce.
Adopting Green Skills	Partial/Limited	Fully Integrated	The curriculum is not yet responsive to the energy transition.

Source: Processed from BPS (2024), Bappenas (2023), Muaddab et al. (2024)

2. Structural Constraint Analysis: Violation of Prosser's Theorem

The research identified two crucial internal weaknesses:

1. **Productive Teacher Crisis:**Referring to Prosser's argument on instructor competence, many vocational high school teachers have purely academic backgrounds without industrial

experience (Lasmini et al., 2024). Data shows that the shortage of productive teachers in 3T areas hinders the transfer of relevant skills.

2. **Infrastructure That Doesn't Replicate Industry**: The gap in facilities between Vocational Schools of Excellence (SMK PK) and small private vocational schools creates a sharp disparity in quality (Suharno et al., 2020). Without industry-standard equipment, Teaching Factories often become mere simulations without the pressures of real production.

3. Policy Implementation: Effectiveness and Challenges

The Center of Excellence Vocational School Program, with its matching fund scheme, has proven effective in stimulating physical investment in industry (Yusuf Aditya, 2024). However, the challenge of implementing the Independent Curriculum in the field still revolves around teachers' capacity to translate Learning Outcomes (CP) into relevant teaching modules (Suhaedin et al., 2024). Furthermore, a study by Bidandari et al. (2025) found that the role of TKDV in the regions is not optimal in aligning the curriculum with regional economic potential.

CONCLUSION

This study reveals three key findings that are crucial in the reconstruction of the vocational education ecosystem of vocational high schools (SMK) towards the Golden Indonesia Vision 2045. First, there are significant gaps in performance indicators such as the 8.62% TPT for vocational high school graduates, which far exceeds the natural target of 3-4%, accompanied by a low HCI of 0.54 and partial adoption of green skills (BPS, 2024; Bappenas, 2023). Second, structural obstacles include a crisis of productive teachers without industry experience and Teaching Factories that fail to replicate the real work environment, violating Prosser's Theorem (Lasmini et al., 2024; Suharno et al., 2020). Third, the implementation of policies such as the SMK Center of Excellence is partially effective, but is hampered by the capacity of TKDV and the Independent Curriculum in the regions (Yusuf Aditya, 2024; Bidandari et al., 2025). These findings emphasize that the transformation towards competitive human capital requires the revitalization of the Regional Public Service Agency (BLUD), teacher returnship, and a green-digital curriculum.

However, this study has limitations in that it relies on secondary SLR data without direct field interviews, so the perspectives of actors in the 3T regions may not be explored in depth. Suggestions for further research include a mixed-methods study with a longitudinal survey of vocational school graduates and an experimental evaluation of the BLUD strategy in a pilot province. Practically, the research implications encourage the Ministry of Education, Culture, Research, and Technology to require teacher returnship every three years and strengthen the TKDV mandate through revised Presidential Regulation No. 68/2022, in order to convert the demographic bonus into a national productivity dividend before 2045.

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