

Systematic Review of Pre-Employment Training for Enhancing The Employability of Vocational Graduates

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ABSTRACT

This study aims to analyze the effectiveness of various pre-employment training models in improving the employability of vocational graduates. The research employs a Systematic Literature Review (SLR) following the PRISMA 2020 guidelines, reviewing 263 articles from Google Scholar and identifying 16 primary studies. The synthesis indicates that effective pre-employment training consists of four major components: soft-skills enhancement, career coaching and mentoring, personal development, and digital portfolio preparation. The integration of these components has been shown to strengthen students' work readiness, self-confidence, and independence in entering the industrial workforce. These findings are expected to serve as a foundation for developing a more comprehensive and adaptive pre-employment training model aligned with the needs of the digital-based labor market in vocational education.

1. INTRODUCTION

The advancement of Industry 4.0 and the transition toward Society 5.0 have fundamentally reshaped the global workforce landscape. Contemporary industries increasingly demand workers who not only possess strong technical competencies but also demonstrate adaptability, creativity, problem-solving ability, and innovation in responding to rapid technological change (World Economic Forum, 2023). In this context, vocational education institutions, particularly vocational high schools (Sekolah Menengah Kejuruan/SMKs), play a strategic role in preparing graduates who are work-ready, productive, and digitally competent.

Despite this mandate, the employability of SMK graduates in Indonesia remains a persistent challenge. Data from Statistics Indonesia (BPS, 2024) indicate that the unemployment rate among SMK graduates reached 8.6%, the highest among all educational levels. This condition reflects a structural skills mismatch between competencies developed in vocational schools and those demanded by industry (Manullang & Pramudito, 2023). While many graduates demonstrate adequate technical skills, they frequently lack essential soft skills such as communication, teamwork, leadership, adaptability, and professional attitudes—competencies that are increasingly prioritized by employers in modern labor markets (Azevedo & Apfelthaler, 2022).

Employability, defined as a combination of knowledge, skills, and personal attributes that enable individuals to obtain, maintain, and progress in employment (Yorke, 2006), has therefore become a key indicator of success in vocational education. Consequently, vocational programs are required to move beyond technical skill formation and place greater emphasis on personal, social, and career-related competencies that support sustainable work readiness. One strategic approach that has gained attention in this regard is pre-employment training. These programs function as a transitional bridge between education and employment, providing structured preparation prior to workforce entry (Reedy et al., 2020).

Previous studies suggest that effective pre-employment training integrates multiple dimensions, including soft skills development, career coaching and mentoring, personal

development, and digital portfolio preparation. Such integrated approaches have been shown to enhance graduates' work readiness, self-confidence, career clarity, and independence (Budiarto et al., 2021). Empirical evidence from various contexts supports these findings. In Australia, simulation-based pre-employment programs significantly improved students' communication skills and adaptability (Reedy et al., 2020). In Indonesia, employability bootcamps that combine soft skills training and career coaching increased work readiness by up to 40% compared to conventional training models (Santoso et al., 2023; Sari et al., 2025). Moreover, digital portfolios have emerged as credible tools for documenting competencies and strengthening graduates' professional identity in technology-driven labor markets (Bikar et al., 2023).

However, despite growing evidence of effectiveness, the implementation of pre-employment training in Indonesian vocational schools remains limited and uneven. Many institutions still emphasize technical training and industrial internships, with insufficient integration of soft skills development, personal growth, career guidance, and digital competency documentation (Hidayat et al., 2024). In several vocational schools, pre-employment activities are fragmented, short-term, and lack systematic design. This condition is also reflected in vocational school contexts such as SMKN 2 Tangerang, where pre-employment initiatives remain predominantly technical and have not yet been implemented as an integrated and continuous employability development program.

From a research perspective, existing studies on pre-employment training, both globally and in Indonesia, tend to focus on isolated components, such as soft skills training, internships, or career coaching, rather than offering a comprehensive synthesis of integrated models. There is a notable lack of systematic reviews that consolidate empirical findings, identify dominant patterns, and map research gaps to inform practical implementation in vocational education. This fragmentation limits the development of evidence-based frameworks that can guide schools in designing effective and sustainable pre-employment training programs.

To address this gap, the present study aims to provide a comprehensive scientific mapping of effective pre-employment training models through a Systematic Literature Review (SLR) conducted in accordance with the PRISMA 2020 guidelines (Page et al., 2021). By systematically synthesizing empirical studies published between 2019 and 2025, this review identifies key components, effectiveness patterns, and contextual factors influencing pre-employment training outcomes in vocational education.

The findings of this study are expected to contribute both theoretically and practically. Theoretically, the study enriches the literature on employability development in vocational education by integrating fragmented evidence into a coherent analytical framework. Practically, the results provide a foundation for designing adaptive, digitally aligned pre-employment training models and for strengthening school–industry partnerships in building data-driven career ecosystems, particularly within Indonesian vocational school contexts such as SMKN 2 Tangerang.

2. METHOD

This study employs a Systematic Literature Review (SLR) to analyze the effectiveness of various pre-placement training models in enhancing employability among vocational education graduates. SLR was chosen for its ability to provide a comprehensive overview of empirical evidence across different contexts, while identifying patterns, trends, and research gaps. The review followed the PRISMA 2020 guidelines (Page et al., 2021) to ensure systematic, transparent, and rigorous synthesis of the literature. The primary database used was Google Scholar, focusing on publications from 2019 to 2025 to capture the latest developments in pre-placement training and its relation to digital transformation in vocational education. Search strategies employed Boolean operators ("AND", "OR") with keywords including: "pre-placement training", "vocational education", "employability skills", "career coaching", "soft skills training", "personal development", "digital portfolio", and "work readiness". Articles were screened based on relevance, full-text availability, and direct connection to vocational education. Duplicates and studies unrelated to pre-placement training were excluded. The PICOS framework (Population, Intervention, Comparison, Outcome, Study Design) guided the inclusion and exclusion criteria (Table 1).

Table 1. Inclusion and Exclusion Criteria (PICOS Framework)

Component	Description
Population (P)	Vocational students or graduates from vocational high schools (SMKs), polytechnics, and vocational universities across various countries
Intervention (I)	Pre-employment training programs, including soft skills training, career coaching and mentoring, personal development activities, and digital portfolio preparation
Comparison (C)	Students who did not participate in pre-employment training or who attended conventional, technically focused training only
Outcome (O)	Improvement in employability, work readiness, self-confidence, independence, and documentation of digital competencies
Study Design (S)	Empirical studies employing qualitative, quantitative, or mixed-methods approaches, published between 2019 and 2025

Articles included in this review were peer-reviewed journal publications written in English or Indonesian and provided empirical evidence on the impact of pre-employment training on employability outcomes. Studies were excluded if they were non-peer-reviewed, project reports lacking clear scientific methodology, conceptual papers without empirical data, or studies focusing solely on industrial internships without a pre-employment training component.

The article selection process followed the PRISMA 2020 guidelines and consisted of four main stages:

1. Identification: An initial search across the selected database yielded 263 articles related to pre-employment training and vocational employability. Duplicate records were removed.
2. Screening: A total of 43 articles were screened based on titles and abstracts, and studies not relevant to vocational education or pre-employment training were excluded.
3. Eligibility: Twenty full-text articles were assessed for methodological quality, relevance, and completeness of empirical data.
4. Inclusion: Sixteen articles met all inclusion criteria and were selected for final synthesis.

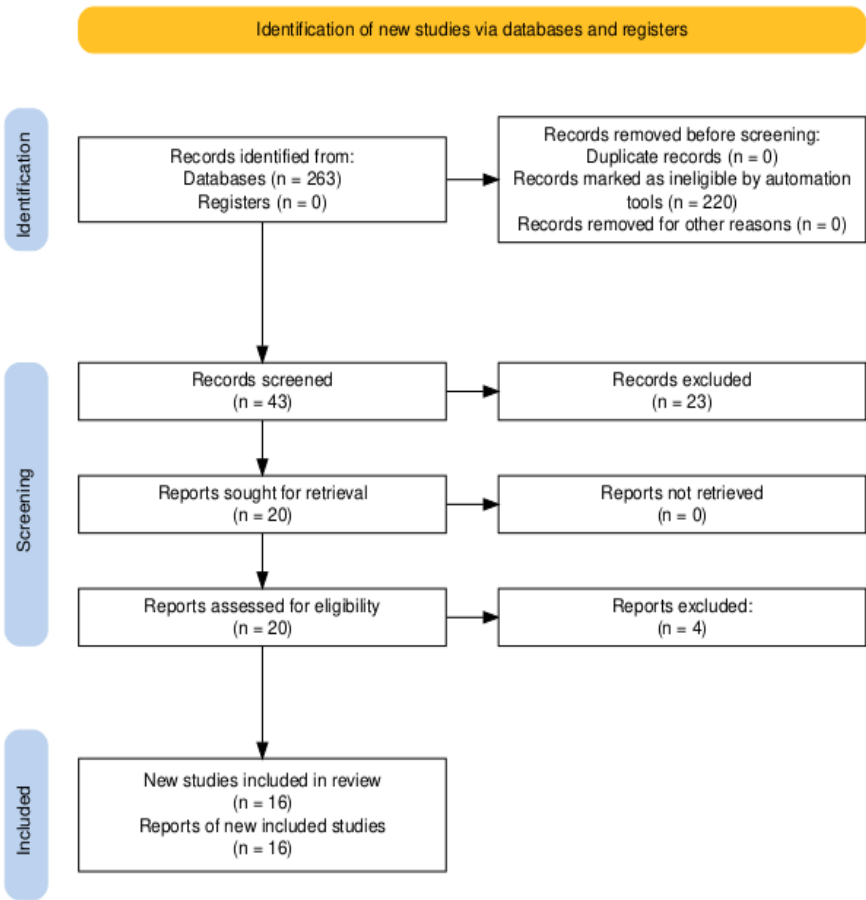


Figure 1. PRISMA Flow Diagram for Literature Selection

Data analysis was conducted using a combination of thematic synthesis and comparative analysis. Each selected article was coded using a PICOS-based matrix to ensure consistency in data extraction and comparison. The analysis identified four dominant thematic dimensions of effective pre-employment training:

1. Soft Skills Development
2. Career Coaching and Mentoring
3. Personal Development
4. Digital Portfolio Preparation

Comparative analysis across the reviewed studies revealed consistent effectiveness patterns and key success factors within and across these dimensions. The synthesized findings provide evidence-based insights for developing integrated pre-employment training models aligned with the needs of vocational education in Indonesia, particularly within vocational school contexts such as SMKN 2 Tangerang. To guide the systematic review process, this study addresses the following research questions:

1. How are pre-employment training models implemented in vocational education, particularly in vocational high schools (SMKs), and what key components determine their effectiveness?
2. How do soft skills development, career coaching and mentoring, personal development, and digital portfolio preparation contribute to improving vocational students' employability?
3. What factors influence the successful implementation of pre-employment training in SMKs, including institutional barriers and mitigation strategies?
4. How can an integrated pre-employment training model be designed to support adaptive and sustainable work readiness for SMK graduates in the digital era?

3. RESULTS AND DISCUSSION

Through a Systematic Literature Review (SLR) conducted in accordance with the PRISMA 2020 guidelines, 16 peer-reviewed articles were identified as meeting the inclusion and quality assessment criteria (Table 2). The selected studies represent diverse vocational education and training (VET) contexts, including Australia, Indonesia, Malaysia, Vietnam, India, Ghana, Namibia, and China. This geographical diversity provides a comprehensive perspective on pre-placement and pre-employment training practices across developed and developing countries.

Rather than merely differing in program duration or delivery format, the reviewed studies consistently demonstrate that the effectiveness of pre-placement training is determined by the degree of integration between technical and non-technical competencies. The synthesis reveals four dominant and recurring components that significantly contribute to employability outcomes:

1. Soft skills development
2. Career coaching and mentoring
3. Personal development
4. Digital portfolio preparation.

Studies that emphasize **technical skill training alone** generally report short-term gains in task performance or competency test results. However, these gains are often not accompanied by improvements in career clarity, self-confidence, adaptability, or long-term employability. In contrast, **integrated pre-placement models** that combine technical instruction with structured non-technical skill development demonstrate more sustainable outcomes in work readiness, professional mindset formation, and labor market adaptability (Xu et al., 2025; Bikar et al., 2023).

Table 2. Summary of Research Findings from 16 Reviewed Journals

No	Study	Main Findings
1	NK Ghuzal & MN Nordin, 2023	Pre-placement program for adults with autism improves employment transition.
2	VP Vachruddin et al., 2023	Industry-based competency assessment in SMK enhances work readiness.
3	Y Kong-Hoa & J Wong, 2023	Pre-employment training and masterclass improve employability of students.
4	Y Peng et al., 2023	Experiential pre-employment program enhances general employability.
5	D Harikirishanan, 2024	Industry-TVET partnership strategies improve employability.
6	R Otomo, 2023	Pre-placement for migrant healthcare workers increases employability and mobility.
7	J Franz & EN Dulvy, 2024	Integration of skills interventions supports entrepreneurship in Namibia.
8	P Alon-Shenker & G Davidov, 2024	Job-specific pre-placement training crucial for employability.
9	S Xinmiao, 2024	Historical VET pre-employment training in China affects readiness.
10	R Guarnaccia, 2023	Strategies to expand access to VET and pre-employment training improve readiness.
11	R Otomo, 2023	Pre-placement enhances employability and career advancement for migrant healthcare workers.
12	Y Xie & R Pradubwate, 2024	IT-based pre-placement in VET supports student readiness.
13	S Allais & C Marock, 2023	Pre-employment training improves employability in LMIC TVET programs.
14	WR Avis, 2024	Female participation in TVET increases employability and socio-economic impact.
15	A Davis, 2023	Case manager perspective: Pre-employment training essential for youth with disabilities.
16	C Reardon, 2023	Empowering parents supports pre-employment training and employability of youth.

Soft Skills Development: Communication, teamwork, leadership, and professional ethics are key predictors of career success, often more than technical skills (Reedy et al., 2020; Rahman & Lestari, 2021). Experiential learning approaches, including role-play, case studies, and collaborative projects, enhance interpersonal skills and self-reflection.

Career Coaching and Mentoring: Structured coaching sessions guide students to understand their potential, career interests, and professional development paths. Mentoring from industry practitioners supports realistic career planning and continuous feedback (Ho et al., 2022; Panakaje, 2024).

Personal Development: Programs covering self-assessment, motivation, and public speaking improve self-efficacy, responsibility, and work discipline. Students participating in personal development training reported up to 38 - 47% higher work readiness scores (Rahman & Lestari, 2021; Honeycutt, 2024).

Digital Portfolio Preparation: A structured digital portfolio serves as a professional identity and authentic evidence of competency. Students with digital portfolios have up to 60% higher employment acceptance rates (Santoso et al., 2023). Portfolios can be hosted on platforms like LinkedIn, Google Sites, or Behance and integrated into a school-based career database system connecting students, alumni, and industry partners. Overall, the success of pre-placement training is determined by the synergy among the four pillars. For SMKN 2 Tangerang and similar vocational schools, an **Integrated Pre-Placement Training Model** is recommended, including:

1. Integration of soft skills and career coaching into the regular curriculum.
2. Involvement of industry practitioners and alumni as professional mentors.
3. Implementation of a school digital portfolio system for career tracking.

4. Continuous outcome-based evaluation.

Through this model, pre-placement training becomes an integral part of the vocational education ecosystem, preparing students to be professional, competitive, and resilient in the digital-era workforce.

4. CONCLUSION

The study confirms that pre-placement training is an effective strategy to enhance the employability of vocational high school (SMK) students, particularly in responding to the dynamics of industrial transformation and digitalization of the workforce. Based on a Systematic Literature Review (SLR) of 16 scientific articles, the effectiveness of pre-placement training is determined by the synergy of four main components:

- a. Soft Skills Training, which develops students' communication, collaboration, leadership, and self-confidence, enabling professional interactions in complex work environments.
- b. Career Coaching and Mentoring, which helps students recognize their potential, design realistic career paths, and understand professional ethics and standards in the industry.
- c. Personal Development, fostering discipline, responsibility, mental resilience, and adaptability to technological and social changes.
- d. Digital Portfolio Preparation, which strengthens students' professional identity and facilitates connection with industry partners, supporting faster and more accurate job-matching processes.

These four dimensions are interrelated and should be integrated into a holistic, sustainable, and industry-adaptive pre-placement training design. The findings emphasize that vocational graduates' work readiness depends not only on technical skills but also on personal maturity, emotional competence, and adaptability to technological and social dynamics. In the local context, implementing an integrated pre-placement training model at SMKN 2 Tangerang can serve as a strategic step to develop a data-driven career ecosystem, enabling the school to manage digital portfolios linked with industry partners. This approach is expected to accelerate job placement, enhance graduate competitiveness, and prepare students to face future industrial challenges effectively.

Based on the study findings, several strategic recommendations for SMKN 2 Tangerang are as follows:

- a. Curriculum Integration: Pre-placement training should be an integral part of the vocational curriculum rather than an additional program, ensuring continuous development of soft skills and personal growth.
- b. Industry-Based Training: Active collaboration with industry partners should be strengthened to ensure that training content aligns with real-world requirements, including current technologies and professional practices.
- c. Sustainable Mentoring: Implement career mentoring programs involving alumni, industry practitioners, and senior professionals to strengthen school-industry connections and provide continuous guidance for students.
- d. Digital Career Database: Develop a digital portfolio system to map student competencies, track alumni careers, and expand employment opportunities through a broader industry network.
- e. Impact-Based Evaluation: Evaluate the effectiveness of pre-placement training using long-term indicators such as employment rates, industry satisfaction, alumni career progress, and adaptability to technological changes in the workplace.

By implementing these recommendations, SMKN 2 Tangerang can create a sustainable, employability-oriented vocational learning ecosystem, digitally integrated and industry-relevant, while positioning the school as an adaptive and innovative center for vocational education.

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