Developing TVET Skills and Employability of Government-link Training Institution: The Case of GIATMARA Malaysia

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Abstract. As global employment landscapes continue to evolve, the need for graduates who are adaptable, competent, and job-ready has become increasingly critical. This study examines how training initiatives, strategic industry collaboration, and competency development influence learner employability within Malaysia's Technical and Vocational Education and Training (TVET) ecosystem. Focusing on GIATMARA - a MARA-affiliated government training agency renowned for producing technically skilled and entrepreneurial graduates—the research adopts a quantitative cross-sectional design. Survey data were collected from 658 GIATMARA graduates and analysed using Structural Equation Modelling (SEM) with SmartPLS 4.0. The findings reveal that learner competency is the strongest determinant of employability and plays a crucial mediating role between training initiatives, industry collaboration, and employability outcomes. Training initiatives were found to significantly strengthen industry partnerships and moderately enhance competency development, underscoring GIATMARA's effectiveness in embedding practical, industry-oriented learning within its programmes. These results provide strong empirical support for the theoretical frameworks and validate a holistic conceptual framework that explains employability as an outcome of integrated training and industry engagement. Overall, the study contributes to the employability literature by offering deeper insight into how TVET systems can align educational outcomes with labour market needs. The findings offer valuable policy and practical implications for decision-makers, training institutions, and industry partners aiming to reduce skills mismatch and support sustainable human capital development in developing economies.

Keywords: Training Initiatives, Learner Competency, Strategic Industry Collaboration, Job Training Program, Learner Employability

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1 Introduction

In the twenty-first century, the global economy is experiencing rapid and far-reaching transformation driven by digitalisation, technological advancement, environmental pressures, and demographic change. These forces are reshaping industries and redefining the nature of work, compelling employers to seek adaptive, technologically proficient, and future-ready talent. As emphasised by the World Economic Forum (2020), the pace of change has placed unprecedented pressure on education and training systems to respond effectively to evolving labour market demands. Yet, despite significant investments in education and workforce development, many countries—both developed and developing—continue to face persistent challenges such as youth unemployment, underemployment, and skills mismatch. These challenges reflect a widening disconnect between education outcomes and labour market needs, posing serious risks to sustainable economic growth and social stability (OECD, 2021).

Against this backdrop, Technical and Vocational Education and Training (TVET) has emerged as a vital mechanism for strengthening human capital development. TVET provides practice-oriented and occupation-specific learning pathways that bridge the gap between formal education and meaningful employment. By equipping learners—particularly those outside traditional academic tracks—with industry-relevant technical skills and essential behavioural competencies, TVET enhances workforce participation, productivity, and economic inclusion (UNESCO, 2021). Its role is especially critical in developing and transitional economies, where livelihoods are closely linked to technical occupations, micro-enterprises, and service-based industries (Ismail et al., 2021). However, despite strong policy support and global advocacy, many TVET systems struggle to achieve optimal outcomes. As economies transition toward knowledge- and technology-driven production, aligning TVET outputs with rapidly changing industry expectations has become increasingly urgent (Tan et al., 2020). This challenge is further compounded by the lack of unified competency assessment frameworks and the inherent difficulty of measuring intangible employability attributes such as adaptability, teamwork, and communication (Shavelson et al., 2019).

At the heart of effective TVET lies its capacity to develop industry-relevant competencies. Competency extends beyond theoretical knowledge to encompass the integration of skills, attitudes, behaviours, and applied performance required for effective occupational functioning (Koenen et al., 2022). Competency-based training (CBT) represents a significant shift from content-centred instruction to performance-oriented learning, ensuring that graduates acquire transferable and job-ready capabilities aligned with workplace standards. Empirical evidence consistently highlights the effectiveness of CBT in enhancing employability outcomes, particularly in addressing employers' growing demand for soft skills such as problem-solving, communication, collaboration, and adaptability (Succi & Canovi, 2020).

The impact of competency development is further strengthened through structured workplace learning experiences, including apprenticeships, internships, cooperative education, and Job Training Programme (JTP). These experiential opportunities enable learners to apply theory in real work settings, internalise professional norms, build confidence, and establish valuable industry networks (ILO, 2020). Studies show that institutions adopting competency-based and workplace-integrated learning models achieve higher graduate employability due to stronger alignment with labour market needs (Yadav et al., 2022; Kamaruzaman et al., 2022). Nevertheless, implementation challenges persist, including outdated curricula, limited industry engagement, insufficient access to modern technologies, and weak governance structures. Addressing these systemic barriers is essential if TVET is to realise its full potential as a driver of economic resilience, inclusive growth, and social mobility in an increasingly complex global economy (UNESCO, 2021).

1.1 Problem Statement

In today's knowledge-driven and innovation-led economy, the development of a capable, resilient, and adaptable workforce has become a strategic imperative rather than a policy option. Human capital now stands at the centre of national productivity, innovation, and long-term economic resilience. Consequently, higher education institutions, TVET providers, and industry stakeholders are increasingly expected to collaborate to ensure that graduates possess competencies aligned with rapidly evolving labour market demands. Despite substantial global investments in education, reskilling, and workforce development, a persistent mismatch remains between training outcomes and employer expectations. This disconnect continues to manifest in unemployment, underemployment, and skills mismatch across both developed and emerging economies, raising serious concerns about the relevance, responsiveness, and effectiveness of existing training frameworks (OECD, 2021; World Economic Forum, 2020).

Extant literature consistently affirms that employability is fundamentally anchored in competency development. Beyond technical and occupational expertise, employers increasingly value transferable competencies such as communication, collaboration, digital literacy, adaptability, and critical thinking (Jackson, 2016; Succi & Canovi, 2020). However, many education and training systems remain constrained by rigid curricula, limited employer engagement, and an excessive emphasis on theoretical instruction. As a result, learners often graduate with fragmented knowledge and insufficient ability to apply learning in real workplace contexts. These shortcomings are particularly evident in systems where educational institutions operate in isolation from industry, lacking structured mechanisms for feedback, curriculum renewal, and co-creation (Kamaruzaman et al., 2022). Without meaningful experiential learning opportunities—such as internships, apprenticeships, workplace simulations, or industry-based projects—learners struggle to develop situational awareness, professional confidence, and applied judgement necessary for effective labour market transition (Tan et al., 2020).

These challenges are further compounded by fragmented collaboration between training providers and industry, especially in developing and transitional economies. Although some institutions maintain formal partnerships with employers, many continue to function in silos, limiting knowledge exchange and constraining innovation in training design and delivery (Ismail et al., 2021). The limited adoption of structured work-based learning models—such as dual training systems or cooperative education—reduces learners' exposure to authentic workplace environments, weakening adaptability and job readiness (ILO, 2020). Consequently, high rates of graduate unemployment and underemployment persist, particularly among TVET graduates who are expected to be work-ready upon program completion (Abdullah et al., 2023).

Against this backdrop, the present study examines the strategic role of training within the TVET context, focusing on how competency-based instruction and industry-linked learning experiences enhance employability and entrepreneurial readiness. By providing empirically grounded insights, the study seeks to inform policy and practice, support TVET curriculum reform, strengthen public–private collaboration, and reinforce competency-based training as a critical catalyst for sustainable human capital development.

2. Literature Review

The purpose of training initiatives extends well beyond the transmission of technical knowledge. Contemporary training emphasises holistic development, encompassing skills acquisition, behavioural change, and measurable performance improvement (Barile et al., 2023). Well-designed training programs are closely integrated with broader human capital strategies, ensuring alignment between learning outcomes, organisational objectives, and national development priorities. In Malaysia and similar emerging economies, Technical and Vocational Education and Training (TVET) institutions play a pivotal role in delivering structured training programs that support economic transformation and workforce upskilling (Ismail et al., 2021). As economies shift from labour-intensive production to knowledge-based and technology-driven systems, sustained investment in education and training becomes essential for developing adaptive, resilient, and employable human capital (OECD, 2021). Understanding the theoretical and practical foundations underpinning training initiatives is therefore critical, particularly in terms of curriculum relevance, instructional design, and implementation effectiveness.

In many developing contexts, TVET systems function as primary mechanisms for human capital development, especially in equipping young people with practical and occupationally relevant skills (UNESCO, 2021). However, the success of these systems depends largely on their ability to align training provision with actual labour market requirements and industry expectations. Within the TVET paradigm, competency is commonly defined as the capacity to apply an integrated set of knowledge, skills, values, and attitudes to perform tasks effectively in specific work environments (Koenen et al., 2022). Mulder (2014) emphasises that competencies are inherently

context-dependent and must be demonstrated in real or simulated work situations, making experiential learning, workplace-based training, and industry engagement indispensable components of effective TVET delivery.

Unlike traditional education models that prioritise theoretical mastery, competency-based TVET focuses on demonstrable outcomes—what learners can competently perform upon program completion. Industry partnerships play a crucial role in this process, as they expose learners to current technologies, professional standards, and authentic workplace practices (Kamaruzaman et al., 2022). Competency frameworks also serve an important function within human resource management, guiding recruitment, training, performance evaluation, and career progression (Campion et al., 2011). Typically, competencies are categorised into core competencies that are transferable across roles and sectors, and technical or job-specific competencies aligned with particular occupations.

3. Theoretical Frameworks

Human Capital Theory (Becker, 1993) remains a foundational framework in understanding the role of education and training in workforce development and economic growth. The theory posits that deliberate investments in education, skills acquisition, and training enhance individual productivity, which subsequently translates into higher earnings, improved employability, and greater national competitiveness. Within the TVET context, this perspective underscores the strategic importance of structured, industry-aligned training initiatives that equip learners with competencies valued in the labour market. By strengthening occupational skills and transferable capabilities, such training not only improves immediate employment prospects but also supports long-term career mobility and income progression (Tan et al., 2020).

Complementing this economic lens, Social Cognitive Career Theory (SCCT), developed by Lent et al. (1994), offers a psychosocial perspective on career development and employability. SCCT emphasises the central role of self-efficacy, outcome expectations, and personal goals in shaping individuals' career-related behaviours and decisions. In TVET settings, this framework is particularly valuable in explaining how learners' confidence in their abilities—often conceptualised as perceived employability—influences motivation, learning engagement, persistence, and career aspirations (Sultana et al., 2022).

Another influential framework informing employability research is the Career EDGE Model proposed by Dacre Pool and Sewell (2007). This model conceptualises employability through five interrelated dimensions: career development learning, work and life experience, subject-specific knowledge, generic skills, and emotional intelligence. It provides a practical blueprint for designing employability-oriented curricula, particularly within vocational and professional education (Jackson & Tomlinson, 2020).

Based on the arguments above, the following hypotheses statements can be formulated:

H_1: There is a significant relationship between Training Initiatives (TI) and Learner Competency (LC).

H_2: There is a significant relationship between Job Training Programme (JTP) and Training Initiatives (TI).

H_3: There is a significant relationship between Strategic Industry Collaboration (SIC) and Training Initiatives (TI)..

H_4: There is a significant relationship between Job Training Programme (JTP) and Learner Competency (LC).

H_5: There is a significant relationship between Strategic Industry Collaboration (SIC) and Learner Competency (LC).

H_6: There is a significant relationship between Learner Competency (LC) and Learner Employability (LE).

H_7: Training Initiatives (TI) mediates significantly in the relationship between Job Training Programme (JTP) and Learner Competency (LC).

H_8: Training Initiatives (TI) mediates significantly in the relationship between Strategic Industry Collaboration (SIC) and Learner Competency (LC).

The empirical framework representing these interconnections is depicted in Figure 1, located in Section 5 of this study.

4. Methodology

This study employs a quantitative, explanatory, and cause-and-effect research design to examine the relationships between training initiatives, industry collaboration, learner competency, and employability among Technical and Vocational Education and Training (TVET) graduates. A quantitative approach is well suited for testing theory-driven hypotheses and for statistically assessing the magnitude and direction of relationships between constructs (Creswell & Creswell, 2017). The explanatory design goes beyond descriptive analysis by seeking to establish causal linkages among variables, drawing on established theoretical foundations such as Human Capital Theory and Social Cognitive Career Theory to explain how training and industry engagement influence competency development and employability outcomes.

The study population comprises graduates of GIATMARA, a major TVET institution operating under Majlis Amanah Rakyat (MARA), a Malaysian government-linked agency dedicated to capacity building and entrepreneurship development. GIATMARA centres are widely distributed across Malaysia and offer skills-based training in areas such as automotive technology, electrical installation, culinary arts, and tailoring, with a strong focus on empowering youth from B40 (low-income) backgrounds. These characteristics make GIATMARA an appropriate and representative context for examining TVET-based human capital development. Using simple random sampling, the study targets graduates who completed their training

within the past three years, ensuring that respondents have sufficient post-training exposure to reflect meaningfully on their competencies and employment experiences. A target sample size of 658 respondents was determined to be adequate for Partial Least Squares Structural Equation Modelling (PLS-SEM) and to support the generalisability of findings (Hair et al., 2013).

Data were collected using a structured questionnaire as the primary research instrument. The questionnaire comprised several sections (Parts A–E), covering demographic information and items measuring the key constructs in the conceptual framework. All study variables were assessed using a five-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). An introductory section outlined the study's purpose, objectives, and ethical considerations, assuring respondents of anonymity, confidentiality, and voluntary participation, with all data collected strictly for academic research purposes.

Questionnaire Layout

- Part A: Respondent demographics
- Part B: Training Initiatives (TI) – 6 items
- Part C: Learner Competency (LC) – 6 items
- Part D: Strategic Industry Collaboration (SIC) – 12 items
- Part E: Learner Employability (LE) – 6 items

The final instrument comprised 39 items and was offered in English and Bahasa Malaysia to accommodate participants' language preferences. All questions required responses, and completion time was estimated at around 15 minutes.

Pilot Study

A pilot test involving 35 respondents was conducted prior to the full rollout of the survey. The objective was to verify the clarity, readability, and flow of the questions, ensuring that respondents could complete the questionnaire without confusion. Data from the pilot were analyzed to assess scale reliability using Cronbach's alpha in SPSS Version 20.

The reliability results surpassed the accepted benchmark of 0.70, demonstrating excellent internal consistency across constructs:

- TI: 0.945
- SC: 0.944
- SIC: 0.970
- OJT: 0.974
- SE: 0.928

These findings confirmed the robustness of the questionnaire and its suitability for the main data collection.

Data Collection Process

The main data collection was carried out via an online survey. Permission and logistical assistance were granted by GIATMARA, which provided access to its database of graduate entrepreneurs. The sampling procedure followed a simple random method, ensuring equal participation opportunity for all qualified individuals. The survey link was distributed electronically by a GIATMARA-appointed coordinator, who circulated it via email to all potential participants. The data collection exercise was conducted throughout December 2024, with respondent eligibility confirmed in coordination with GIATMARA representatives.

A total of 658 valid questionnaires were gathered for analysis in this study. Table 1 presents the summary of respondents' demographic characteristics. The findings show that the majority of participants were female (63.8%, n = 420), while males constituted 36.2% (n = 238) of the total sample.

With respect to age distribution, the 26–35 years category represented the largest proportion, accounting for 35.9% (236 respondents). This was followed by the 36–45 years age group with 26.0% (171 respondents). Respondents aged 18–25 years made up 23.4% of the sample, whereas older groups—46–55 years (12.9%), 56–60 years (1.5%), and above 60 years (0.3%)—formed smaller segments of the population.

In terms of educational attainment, more than half of the respondents (57.4%) possessed an SPM or equivalent qualification. A further 16.4% had completed STPM or pre-university studies, 8.4% held a bachelor's degree, and 17.8% reported having other forms of certification. These statistics indicate that the sample primarily comprises young to mid-career participants with a moderate level of education.

Table 1. Demographics of Respondents (n = 658)

Characteristics	Categories	Frequency	Percentage (%)
Gender	Male	238	36.2
	Female	420	63.8
Age	18 – 25	154	23.4
	26 – 35	236	35.9
	36 – 45	171	26.0
	46 – 55	85	12.9
	55 - 60	10	1.5
	> 60	2	0.3
Education	SPM/Certificate	378	57.4
	STPM/Pre-University	108	16.4
	Bachelor Degree	55	8.4
	Other Qualifications	117	17.8

5. Data Analysis

Partial Least Squares Structural Equation Modelling (PLS-SEM) was employed as the primary analytical technique to test the proposed research framework. Preliminary data

screening using box plot diagnostics revealed no significant extreme outliers; therefore, all 658 valid responses were retained for final analysis. PLS-SEM was selected due to its suitability for complex path models (Hair et al., 2013), and all analyses were conducted using SmartPLS 4.0. The study followed the two-step procedure recommended by Anderson and Gerbing (1988), beginning with the evaluation of the measurement model and followed by structural model testing. Measurement model assessment focused on reliability, convergent validity, and discriminant validity (Hair et al., 2019). Convergent validity was established by examining indicator loadings, with a minimum threshold of 0.70 applied.

After establishing convergent validity, construct reliability was assessed using Cronbach's Alpha, Composite Reliability, and Average Variance Extracted, with threshold values of CA > 0.70, CR > 0.70, and AVE > 0.50. Meeting these benchmarks confirmed strong internal consistency and measurement stability. Discriminant validity was subsequently evaluated using cross-loadings, and the Heterotrait–Monotrait (HTMT) ratio, with HTMT values below 0.90 indicating adequate construct distinctiveness. Model adequacy was further examined through R^2 values to assess explanatory power. Hypothesis testing was then conducted using path coefficients and p-values, where relationships with $p < 0.05$ were considered statistically significant.

6. The Results

6.1 Measurement Model Assessment

A SEM-PLS analysis was performed (Table 2) to determine the model fit, reliability and validity of the scales. Regarding model fit, the fit indices meet the minimum threshold specified by Hu and Bentler (1999). This suggests good model fit. The factors' Cronbach alpha and composite reliabilities are above 0.90 (> 0.70), respectively (Hair et al., 2021). Therefore, the reliability of the items was supported. In addition, the average variance extracted (AVE) values shown in Table 3 were above 0.70 (> 0.50) that indicate the convergent validity of all the constructs was met.

Table 2. The Model Fit (incl. Convergent Validity)

	Cronbach's Alpha (CA)	Composite Reliability (CR)	Average Variance Extracted (AVE)
Strategic Industry Collaboration (SIC)	0.937	0.960	0.888
On-Job Training (OJT)	0.950	0.968	0.909
Learner Competency (LC)	0.925	0.943	0.769
Learner Employability (LE)	0.919	0.939	0.756
Training Initiatives (TI)	0.924	0.943	0.767

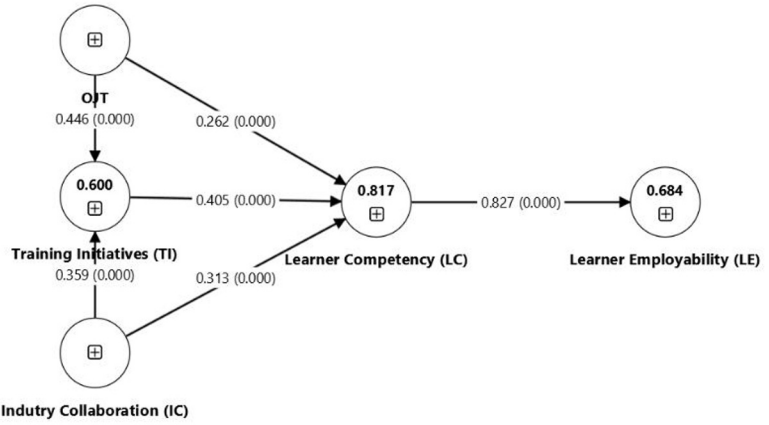
Table 3. Discriminant Validity (HTMT)

	Strategic Industry Collaboration (SIC)	Learner Competency (LC)	Learner Employability (LE)	On-Job Training (OJT)
Strategic Industry Collaboration (SIC)				
Learner Competency (LC)	0.895			
Learner Employability (LE)	0.844	0.895		
On-Job Training (OJT)	0.900	0.888	0.837	
Training Initiatives (TI)	0.790	0.896	0.764	0.798

From Table 3, there is a clear discriminant validity among other constructs as the questionnaire items met the HTMT threshold of 0.90 or lower (Henseler et al., 2015).

6.2 Structural Model Assessment

Figure 1 presents the estimated model using survey data collected from 658 respondents. SmartPLS 4.0 software was used to analyse the model. Table 4 presents the path coefficients for the direct and indirect relationships within the research framework depicted in Figure 1.



(*Note*: ***Sig. at 0.01 significance level, p-values in the parentheses)

Fig.1. The Estimated Structural Model

Table 4. Path Coefficients

Hypothesis	Path Coefficient	S.D.	t-Statistic	p-Value
H_1:Training Initiatives (TI) -> Learner Competency (LC)	0.405	0.032	12.498	0.000***
H_2:On-Job Training (OJT) -> Training Initiatives (TI)	0.446	0.077	5.679	0.000***
H_3:Strategic Industry Collaboration (SIC)-> Training Initiatives (TI)	0.359	0.076	4.720	0.000***
H_4: On-Job Training (OJT)- > Learner Competency (SC)	0.262	0.040	6.570	0.000***
H_5:Strategic Industry Collaboration (SIC)- > Learner Competency (SC)	0.313	0.042	7.462	0.000***
H_6:Learner Competency (LC)-> Learner Employability (LE)	0.827	0.021	39.117	0.000***
H_7:Job Training Program (OJT) -> Training Initiatives (TI) -> Learner Competency (SC)	0.181	0.036	5.037	0.000***
H_8:Strategic Industry Collaboration (SIC)-> Training Initiatives (TI) -> Learner Competency (SC)	0.145	0.032	4.570	0.000***

Note: ***Significant at 0.01 significance level

The path analysis model illustrated in Figure 1 provides a comprehensive representation of the structural relationships among Strategic Industry Collaboration (SIC), Job Training Programme (JTP), and Training Initiatives (TI) in shaping Learner Competency (LC) and, ultimately, Learner Employability (LE). Each directional path in the model is supported by statistically significant coefficients, with all relationships achieving p-values of 0.000, indicating a very high level of confidence in the observed effects. Among these relationships, the most substantial direct effect is observed between Learner Competency and Learner Employability (β = 0.827***), unequivocally establishing competency as the strongest predictor of employability outcomes. This result reinforces a central tenet of employability research—that graduates' ability to secure and sustain employment is fundamentally driven by the

depth and relevance of their competencies rather than by credentials alone (Yorke & Knight, 2006; Jackson & Wilton, 2016).

Beyond this dominant relationship, the model demonstrates that Training Initiatives (β = 0.405*), Industry Collaboration (β = 0.313*), and Job Training Programme (β = 0.262*) all exert significant positive effects on Learner Competency. These findings suggest that competency development is not the product of a single intervention but rather emerges from an integrated ecosystem of structured instruction, industry engagement, and experiential learning. Training Initiatives provide the formal foundation through curriculum design and skills instruction, while Industry Collaboration ensures alignment with current workplace practices and employer expectations. Job Training Programme complements these elements by allowing learners to apply, test, and refine their skills in authentic work environments. Importantly, the model also reveals meaningful indirect effects that further illuminate these dynamics. For instance, Industry Collaboration positively influences Training Initiatives (β = 0.145*), indicating that engagement with industry partners enhances the relevance and effectiveness of institutional training programs. Similarly, the positive effect of JTP on Training Initiatives (β = 0.181*) underscores the reinforcing role of experiential learning in strengthening formal instructional design. Collectively, these interdependencies highlight a synergistic system in which education and industry exposure mutually reinforce one another to build competencies that drive employability.

Within the specific context of GIATMARA, the findings provide strong validation of its industry-integrated TVET model. The positive effects of Industry Collaboration and On-the-Job Training on Learner Competency demonstrate that GIATMARA's emphasis on applied learning, hands-on skill development, and sustained industry engagement is highly effective in producing labour-market-relevant competencies. By embedding practical exposure and industry input into its instructional framework, GIATMARA equips learners with skills that are closely aligned with Malaysia's evolving workforce demands, thereby strengthening national human capital capacity (Azmi & Salleh, 2021; Ramli et al., 2020). These results are consistent with prior studies highlighting GIATMARA's integrated, competency-based approach as a robust pathway for producing job-ready graduates (Ali, 2015; Chear & Arifin, 2024).

What ultimately distinguishes this study is the development of a comprehensive and quantifiable model that captures both direct and mediated relationships among training, industry engagement, competency development, and employability. The use of path analysis enables clear visualisation of causal linkages and provides nuanced insights into how multiple educational and experiential elements interact within a system. The consistently high levels of statistical significance ($p < 0.001$) further affirm the robustness and reliability of the findings. By integrating structured training, work-based learning, and industry collaboration, the model presents a realistic, system-level understanding of employability development that offers both strong theoretical contributions and actionable guidance for TVET institutions, industry partners, and policymakers.

7. Conclusions

In conclusion, the findings of this study clearly demonstrate that Strategic Industry Collaboration (SIC), Job Training Programme (JTP), and structured Training Initiatives (TI) have a significant and positive impact on Learner Competency (LC), which emerges as the most influential driver of Learner Employability (LE). Learner competency stands at the core of employability development, directly shaping graduates' readiness and capacity to succeed in the labour market. Notably, both JTP and SIC play equally critical roles by strengthening competencies and translating training into tangible employment outcomes when effectively embedded within instructional frameworks. While the study acknowledges limitations related to data scope and research design, the implications remain compelling. Education and training systems must prioritise experiential learning, deepen industry engagement, and adopt competency-based approaches to produce adaptable, job-ready graduates. For policymakers and practitioners, the success of GIATMARA's TVET model illustrates how well-integrated, industry-focused training can bridge skills gaps, enhance employability, and support sustainable workforce development in an increasingly competitive economic landscape.

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Disclosure statement
No potential conflict of interest was reported by the author(s).

Ethical Considerations
This study will adhere to ethical guidelines for human subject research, ensuring respect, confidentiality, and informed consent.

- **Informed Consent:** All participants have been briefed by the management of GIATMARA via the online questionnaire on the study objectives, their voluntary participation, and their right to withdraw at any point without penalty. Consent was obtained before starting the survey.
- **Anonymity and Confidentiality:** No identifying information will be collected. Data will be stored securely and used only for academic purposes.
- **Data Security:** All digital data will be password-protected and stored on secure servers with limited access.
- **Ethical Approval:** Since GIATMARA is a government-linked training institution under MARA-a government agency that provides full sponsorships for participants during training programs-participation in the survey is considered a voluntary obligation for all trainees. As such, formal ethical approval was not required.

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