



*CORRESPONDENCE

Aditia Gustiana Gunawan, ✉
aditia.gustiana.2505519@studsns.um.ac.id

RECEIVED 13 February 2026

ACCEPTED 16 March 2026

PUBLISHED 30 April 2026

CITATION

Gunawan AG, Mariana RR, Tuwoso, Suswanto H, Irham (2026) The Role of Career Guidance in Strengthening Link and Match in Vocational Education: A Systematic Literature Review. *Eduscape : Journal of Education Insight*. 4 (2), 68-80.
doi:
10.61978/eduscape.v4i2.1438

TYPE Original Research

PUBLISHED 30 April 2026

DOI 10.61978/eduscape.v4i2.1438

VOL 4 Issue 2 April 2026

COPYRIGHT

© 2026 Gunawan, Mariana, Tuwoso, Suswanto, and Irham. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

The Role of Career Guidance in Strengthening Link and Match in Vocational Education: A Systematic Literature Review

Aditia Gustiana Gunawan^{1*}, Rina Rifqie Mariana², Tuwoso³, Hary Suswanto⁴, Irham⁵

¹²³⁴ Universitas Negeri Malang, Jakarta, Indonesia

⁵ Universiti Sains Malaysia, Pulau Pinang, Malaysia

Abstract

Persistent skills mismatches and prolonged school-to-work transitions among vocational education and training (VET) graduates, intensified by Industry 4.0, highlight the need for stronger alignment between VET systems and labor market demands. Career guidance has emerged as a key institutional mechanism supporting employability and workforce readiness. However, its integrative role in linking educational outcomes with labor market needs remains insufficiently synthesized. This study systematically reviews how career guidance in VET is conceptualized, implemented, and evaluated in relation to employability. Using PRISMA guidelines, a systematic literature review was conducted across Scopus, ScienceDirect, SpringerLink, ERIC, and Google Scholar, yielding 41 peer-reviewed articles. Thematic synthesis shows that career guidance functions as an integrated mechanism enhancing employability, career adaptability, and workforce readiness. Key approaches include Work-Integrated Learning, competency-based frameworks, and digital career guidance platforms, which improve career awareness and alignment with labor market needs. Challenges identified include limited institutional capacity, insufficient expertise, technological disparities, and weak labor market information systems. The study integrates Human Capital Theory, Social Cognitive Career Theory, and Career Construction Theory within a lifelong learning perspective to explain the multidimensional role of career guidance. These findings offer policy and practical insights for strengthening career guidance systems to support sustainable workforce development in the digital economy.

KEYWORDS

career guidance; vocational education; employability; workforce alignment; systematic literature review.

Introduction

Vocational training is one of the key components in the preparation of a skilled labour force that corresponds to labour market needs. Link and match has been strongly advocated to ensure compatibility of learning outcomes with industry needs (Sharma & Sharma, 2019). This approach focuses on the integration of curriculum, competency standards and graduate attributes with those of professions advancing towards dynamic workforce requirements. Despite the expansion of industry-led initiatives, work-based learning programs, and institutional partnerships within vocational education systems, a substantial proportion of VET graduates continue to face prolonged school-to-work transitions and underemployment, reflecting persistent skills mismatches and weak labor market alignment. This situation underscores the importance of career guidance as a critical institutional

mechanism influencing the effectiveness of the transition process from school to work by supporting informed career decision-making, competency alignment, and adaptive workforce integration. Vocational guidance is a formal process to help students understand their interests, choosing the right career path, vocational training or job that better fits for students with their abilities and interest (Godden, 2022; Haasler & Barabasch, 2015). In vocational education, career counseling is assumed to help students make informed occupational choices, improve employability skills, and assist in adjusting to changing labor market requirements. Good career guidance not only helps individual's to make better career decisions, but also it increases individuals' and institutions' ability to respond to labour market changes.

Recent researches have drawn considerable attention to the combination of career guidance with vocational education system. Career counseling promotes students' career maturity, career adaptability and job readiness which are important indicators of employability outcomes. Furthermore, with the growing change of labor market as a result of technological development, globalization and industrial reformation into digitalization, vocational students have to possess not only professional capacities but also career plans and adaptability to keep competitive (Robertson, 2018).

Career guidance has long been recognized as an important aspect of vocational education, yet existing literature in the area can be both narrow and fragmented, largely concentrating on specific issues such as employability skills or counseling practices. It requires an integrated review of empirical and conceptual outputs in order to grasp how career guidance facilitates link and match between VET (Powell et al., 2024) and labour-market needs. Given limited review of the literature on the role that career guidance plays in ensuring vocational education outcomes are aligned with workforce needs, this study seeks to systematically review existing research and consolidate findings.

Despite the growing focus on career guidance in vocational education research, it remains fragmented and not systematically integrated into the context of link and match between educational provision and labor market demand as discussed in literature. Most research studies focus on the effectiveness of career guidance with respect to certain student assessments, such as career readiness, career maturity, or employability skills. Although these studies are useful, many treat career guidance as an independent intervention rather than it being understood as a strategy that links the vocational education tool kit to industry demands (Yakubu & Bayong, 2025).

Existing scholarship on the "link and match" agenda in vocational education and training (VET) largely concentrates on curriculum alignment, industry-institution partnerships, and work-based learning as primary mechanisms for improving workforce readiness. These studies confirm that structural collaboration between education providers and industry actors enhances technical skill relevance and practical exposure. However, far less attention has been given to the mediating role of career guidance within this alignment framework. Specifically, limited empirical and conceptual work explains how career guidance integrates labor market intelligence into students' career decision-making processes, how it supports competency alignment beyond curriculum design, and how it contributes to measurable link-and-match

outcomes such as employability and transition-to-work success. This gap is significant because workforce alignment is not solely a curricular or institutional issue; it also depends on students' capacity to interpret occupational opportunities, develop adaptive career competencies, and strategically navigate labor market entry. Without understanding the systemic role of career guidance, link-and-match strategies risk remaining structurally sound but individually ineffective.

Therefore, this study addresses this overlooked dimension by systematically examining how career guidance in VET is conceptualized, implemented, and positioned as an industry-oriented mechanism to strengthen competency fit and workforce alignment. A further shortcoming in the literature is the absence of integrated conceptual frameworks which explains how career guidance affects school-to-work transitions, specifically within vocational education settings (Hughes et al., 2021). Most research studies are limited to program evaluation or descriptive surveys and few attempt to engage with guiding theories that explain connections between career counseling processes, competency growth, and employment consequences. This theoretical void constrains the capacity to view career guidance as a systemic and strategic educational intervention.

Furthermore, it has been shown by earlier studies that career guidance is highly diversified for vocational education systems and national contexts. Nonetheless, there is scant overview and synthesis of best models, best practices and key success factors that can be used to inform policy design and institutional strategy. Without integrated evidence, it is difficult to develop standard approaches for career guidance in prior or further vocational education.

Rapid technological change, digitalization, and Industry 4.0 have increased demand for digital literacy, data-driven skills, and transversal competencies, while simultaneously reshaping career pathways toward more dynamic and non-linear employment trajectories. However, we found little research combining the changes of labor market with how career guidance in VET could change in order to respond dynamically to them, especially for vocational students preparing for career adaptability and lifelong learning competencies. These gaps point to the need for a systematic review to combine empirical and conceptual work so as to gain an in-depth understanding of the role played by career guidance in supporting link match/vocational education functioning. Based on the identified research gaps, this study formulates the following research questions: 1) How is career guidance conceptualized and implemented within vocational education systems?, 2) What roles does career guidance play in strengthening the link and match between vocational education outcomes and labor market needs?, 3) What career guidance models or approaches are reported in the literature to support vocational students' employability and career readiness?, 4) What challenges and barriers are identified in the implementation of career guidance for improving workforce alignment?, 5) What future directions are suggested in the literature for strengthening career guidance in vocational education systems?.

Methods

The article selection process followed the PRISMA 2020 guidelines to ensure a systematic and transparent review



Figure 1. Keyword Search

procedure. The identification phase involved a comprehensive literature search conducted in 2016-2026 across five major academic databases: Scopus, ScienceDirect, SpringerLink, ERIC, and Google Scholar. The search strategy employed a combination of keywords related to vocational education, career guidance, employability, and workforce alignment. The search strings were constructed using Boolean operators (AND/OR) to broaden and refine the results. An example of the search string used can be seen in [Figure 1](#).

The search was conducted within title, abstract, and keyword fields in each database to ensure relevance to the research topic. Using predefined keywords related to vocational education, career guidance, employability, and workforce alignment, a total of 612 records were initially identified, 478 articles were subjected to another stage of screening. Article titles and abstracts were screened at the screening stage for relevance to the topic of interest.

This process led to the elimination of 319 articles which were not directly focused on career guidance, vocational education or workforce alignment. One-hundred and fifty-nine articles then passed through the eligibility phase, involving full-text review. In this stage, another 112 papers were excluded for a range of reasons including insufficient methodological clarity, lack of depth in the discussion on career guidance implementation or irrelevance in terms of vocational education. In the end, 41 articles that fit all of the inclusion criteria were identified for qualitative synthesis. These included studies that became the main data sources for examining the impact of career guidance on enhancing link and match in vocational education. (See [Figure 2](#)).

Table 1. Inclusion and Exclusion

Criteria	Inclusion	Exclusion
Publication Type	Peer-reviewed journal articles	Conference papers, books, thesis, reports
Research Topic	Career guidance, vocational education, link and match, employability	Studies unrelated to career guidance or vocational education
Language	English	Non-English publications
Publication Year	2016–2026	Articles published before 2016
Research Design	Empirical and conceptual studies	Opinion articles without methodological explanation
Accessibility	Full-text available	Abstract-only or inaccessible full text
Educational Context	Vocational education / TVET	General education without vocational focus

Quality Appraisal

To enhance the methodological rigor of the review, the included studies were subjected to a quality appraisal process. Each article was evaluated based on several criteria, including research design clarity, methodological transparency, relevance to vocational education contexts, and the depth of discussion regarding career guidance implementation. Studies that lacked sufficient methodological explanation or empirical grounding were excluded during the eligibility stage.

Data Extraction and Thematic Synthesis

Data from the selected studies were systematically extracted using a structured coding framework to ensure consistency and comparability across the included articles. The extraction process focused on several key aspects of each study, including the author and publication year, research objectives, research design and methodology, country or educational context, type of career guidance intervention, and the main findings related to employability and workforce alignment within vocational education systems. This structured extraction enabled the researchers to organize relevant information and identify patterns across different studies.

Following the extraction process, the analysis was conducted using a thematic synthesis approach. The analytical procedure consisted of three main stages. The first stage involved the initial coding of key findings reported in each study to identify meaningful concepts related to career guidance practices and outcomes in vocational education. In the second stage, similar concepts were grouped and categorized into broader thematic categories that reflected recurring patterns across the literature. The final stage involved the development of higher-level analytical themes that described the main trends and relationships emerging from the reviewed studies.

Through this thematic synthesis process, the review was able to identify recurring career guidance models, institutional challenges in implementation, and emerging trends in career guidance practices within vocational education systems. This approach provided a comprehensive understanding of how career guidance contributes to strengthening the alignment between vocational education outcomes and labor market needs. (See [Table 1](#)).

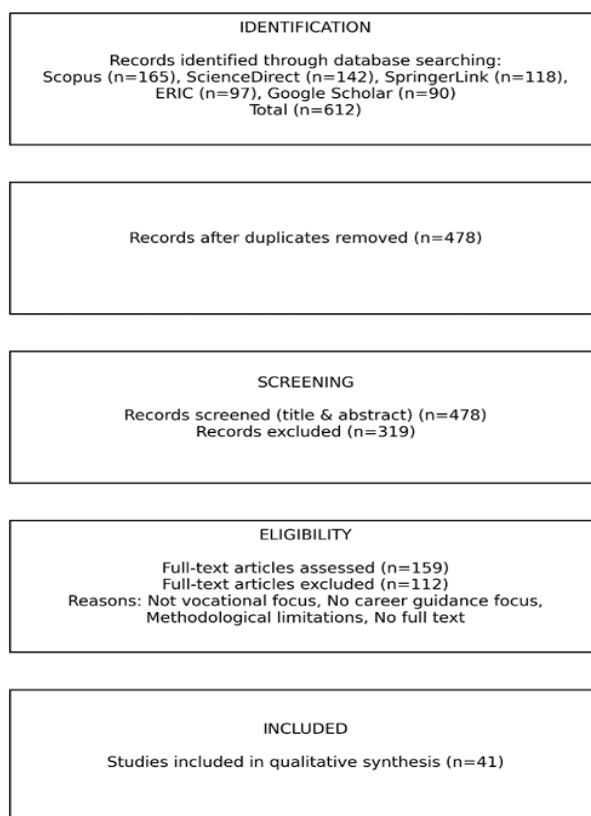


Figure 2. Flow Diagram Selection

Result and Discussion

A total of 41 peer-reviewed journal articles were retained for the systematic literature review following the PRISMA-based screening and selection step. Thematic synthesis was employed to answer the following five research questions about the understanding, implementation, effectiveness, difficulties and future development of CG in VET. (See [Table 2](#)).

Conceptualization and Implementation of Career Guidance in Vocational Education

The results suggest that career guidance in VET is framed more and more as a multisided and developmental process to foster students' career readiness, career decision-making and school-to-work transition. Far from being an independent counseling activity, modern career guidance is conceived as an integral part of lifelong integrated educational strategies which include not only technical skills and employability but also lifelong career

Table 2. Journal Relevant.

Author(s) / Title	Strengths	Gaps	Opportunities
(Soproni, 2023) - Employability Skills – Rethink Your Learning	Discusses the impact of AI on employability and lifelong learning in higher education; highlights the need for rethinking curricula to include employability skills; based on literature review and recommendations for tutors, students, and employers.	Limited empirical data; focuses mainly on theoretical aspects without extensive case studies; does not deeply explore implementation challenges in diverse cultural contexts.	Integrate AI and technology-focused modules into curricula; develop partnerships between universities and employers for practical training; promote lifelong learning programs to adapt to evolving job markets.

adaptability.

The literature reviewed indicates a movement towards competency-based and student-centered career guidance models. A number of studies stress the importance of including employability skills, including problem-solving, communication and adaptability within vocational career development (Ivanov & Webster, 2019; Yildiz, 2020). Additionally, work-integrated learning (WIL) has often been referenced as a key strategy used in practice to enrich experiential learning and better prepare students with their understanding of workplace expectations.

In practice, career information is available in many VET systems through mechanisms such as structured programs (including occupational information, online and written materials), career counseling services, industry involvement, work experience programs and curriculum links (Maloney & Bright 2007). Yet cross-national comparisons display substantial heterogeneity in quality of implementation, partly due to institutional capacity and policy support, and infrastructure.

(Nilsson, 2017) - Employability, Employment and the Establishment of Higher Education Graduates in the Labour Market	Analyzes structural changes in Sweden's labor market and their impact on graduates; discusses shift from knowledge-based to skill-based economies; provides policy implications for higher education.	Primarily focused on Sweden and OECD countries, limiting generalizability; lacks quantitative data on long-term outcomes; does not address non-traditional career paths like freelancing.	Enhance vocational orientation in higher education programs; collaborate with industries to align curricula with market needs; invest in lifelong learning to address skill mismatches.
(Souto-Otero et al., 2023) - High skilled workplaces, technological change and employment: Can educational reform do it?	Explores the role of education in countering technological unemployment; uses human capital theory and empirical data; discusses policy recommendations for social relations in education reform.	Relies on theoretical models with limited real-world case studies; focuses on high-skilled sectors, overlooking low-skilled impacts; does not fully address global inequalities.	Reform education to emphasize skills over rote knowledge; foster inclusive labor markets through policy; promote continuous upskilling via public awareness and targeted interventions.
(Ong & Lim, 2023) SkillRec: A Data-Driven Approach to Job Skill Recommendation for Career Insights	Introduces a data-driven system for skill recommendations using network analysis; addresses skill gaps in job seekers; provides practical tool for career planning in dynamic markets.	Based on limited datasets (e.g., LinkedIn); may not capture soft skills or emerging trends; lacks longitudinal studies on recommendation efficacy.	Integrate AI tools into career services; collaborate with platforms like LinkedIn for real-time data; develop personalized career pathways for students.
(Kolawole et al., 2025) - Industrial Education as a Tool for Developing Vocational Skills	Advocates for industrial education to bridge education-industry gap; discusses policy recommendations for developing countries; emphasizes ICT and vocational training.	Primarily theoretical; lacks specific case studies or data; focused on certain regions without global comparison.	Strengthen industry-academia partnerships; integrate vocational skills into curricula; promote policy reforms for sustainable development.
(Duarte et al., 2017) - Career Adaptability, Employability, and Career Resilience in Managing Transitions	Explores psychological aspects of career transitions; uses case studies; highlights resilience and adaptability in managing changes.	Small sample size in case studies; qualitative focus limits generalizability; does not integrate quantitative metrics.	Develop programs focusing on psychological resilience; incorporate into HE counseling; research long-term impacts on career success.
(Billett, 2026)- Contemporary Purposes for Vocational Education	Discusses intentional design of vocational education; emphasizes enactment and progression; provides framework for pathways.	Theoretical; lacks empirical validation; focused on vocational rather than general HE.	Align vocational education with employability needs; create progressive pathways; collaborate with industries for practical enactment.
(Di Fabio et al., 2022). - Revitalising career counseling for sustainable decent work and decent lives: From personality traits to life project reflexivity for well-being	Introduces Life Project Reflexivity (LPR) as a key construct for career counseling; empirical study on Italian university students showing LPR's role in enhancing hedonic and eudaimonic well-being beyond personality traits; emphasizes strength-based prevention for sustainable work.	Focused on Italian context and university students, limiting generalizability; relies on self-report measures; does not explore long-term outcomes or interventions.	Develop targeted career counseling programs incorporating LPR; extend research to diverse populations and longitudinal designs; integrate with global sustainability frameworks for decent work.
(Billett, 2025) - Constituting integration in work-integrated education and learning	Conceptual framework for integrating work and education experiences; emphasizes intentional design and enactment; provides insights into student progression and accessibility in vocational education.	Theoretical focus without new empirical data; limited to vocational contexts; overlooks digital integration challenges post-COVID.	Enhance work-integrated learning (WIL) programs with practical tools; collaborate on cross-cultural studies; explore AI and remote work in WIL for future adaptability.
(Godden, 2022)- Career guidance policy documents: translation and usage	Examines how policy documents are translated and used in career guidance; highlights implementation gaps; uses qualitative analysis for practical implications in educational settings.	Primarily policy-oriented with limited practitioner perspectives; focused on specific regions; lacks quantitative validation.	Bridge policy-practice divides through training; develop user-friendly policy tools; research digital platforms for policy dissemination and usage.

(Robertson, 2018)- Developing career capabilities in “NEET” young people: experiences of participants in the Prince’s Trust team programme	Qualitative insights from NEET youth in a UK program; focuses on building career capabilities and resilience; practical recommendations for youth interventions.	Small sample size from one program; UK-centric; no long-term follow-up on outcomes.	Scale similar programs globally; integrate with employability skills training; longitudinal studies to assess sustained career impacts.
(Dodd et al., 2019) - Decent work in the UK: Context, conceptualization, and assessment	Contextualizes decent work in the UK; develops conceptualization and assessment framework; addresses policy and measurement gaps in vocational behavior.	UK-focused, limiting international applicability; early manuscript stage without full empirical testing; overlooks intersectional factors like gender or ethnicity.	Adapt framework for global contexts; conduct cross-national validations; inform policy reforms for inclusive labor markets.
(Jackson et al., 2025). - Career resources and securing quality work: graduate perspectives	Explores graduate views on career resources for quality employment; highlights skills, networks, and experiences; practical implications for higher education.	Graduate-focused, potentially overlooking mid-career transitions; qualitative data from specific regions; lacks quantitative metrics.	Enhance university career services; foster industry partnerships; research resource access in underrepresented groups.
(Pavlova & Askerud, 2024) A Euro-Asian look at challenges to innovation and the greening of industries: implications for TVET and strategic policy formulation	Comparative Euro-Asian analysis on greening industries; implications for TVET policy; addresses innovation and sustainability challenges.	Broad scope may lack depth in specific countries; policy-focused without extensive empirical data; emerging field with limited longitudinal insights.	Develop green skills curricula in TVET; promote international policy collaborations; track long-term impacts of greening on workforce skills.
(Hughes et al., 2021). - Building better futures: decent work, inclusion and careers support services in the UK	Focuses on decent work and inclusion in UK careers services; policy recommendations for support systems; emphasizes equity and accessibility.	UK-specific; conceptual with limited new data; does not deeply address post-pandemic shifts.	Expand to EU or global frameworks; integrate digital career tools; evaluate inclusion strategies through impact studies.
(Pavlova, 2019)- Emerging environmental industries: impact on required skills and TVET systems	Analyzes skills needs in environmental industries; implications for TVET reforms; promotes sustainable development through education.	Theoretical and broad; lacks specific case studies; focused on emerging industries without mature sector comparisons.	Align TVET with green job demands; foster public-private partnerships; research skill evolution in climate-adaptive economies.
(Peter et al., 2025). - Mapping the landscape of TVET education: a global bibliometric analysis	Comprehensive bibliometric review of TVET (2014-2024); identifies trends, authors, and themes; highlights global growth and policy needs.	Relies on database limitations; bibliometric focus without qualitative depth; time-bound to recent decade.	Guide future TVET research agendas; enhance interdisciplinary collaborations; update analyses for post-2024 trends including AI integration.
(Areisy & Sudira, 2022)- Employability skills of state vocational high school students on welding engineering expertise competency	Empirical focus on employability skills in vocational high school welding programs; identifies key competencies for industry readiness; contributes to vocational education literature in Indonesia.	Limited to Indonesian context and specific welding expertise; lacks longitudinal data on long-term employability outcomes; small sample size may reduce generalizability.	Expand to other vocational fields or international comparisons; develop training interventions based on identified skills; integrate with digital welding technologies for Industry 4.0 alignment.
(Rudolph et al., 2019)Cort - Empirical developments in career construction theory	Comprehensive review of empirical advancements in career construction theory; highlights conceptual and practical implications; draws from diverse publications for robust insights.	Primarily theoretical synthesis with limited new primary data; focuses on Western contexts; overlooks emerging career challenges like gig economy or AI impacts.	Test theory in diverse cultural settings; incorporate modern career disruptions (e.g., pandemics, automation); develop practical tools for career counseling based on findings.
(Okolie et al., 2021) - Improving graduate outcomes: Implementation of problem-based learning in TVET systems of Nigerian higher education	Qualitative insights from diverse stakeholders on PBL in Nigerian TVET; identifies challenges and proposes a framework for implementation; promotes quality graduate outcomes through theory-practice integration.	Nigeria-specific focus limits broader applicability; relies on interviews without quantitative validation; does not evaluate long-term PBL impacts on employability.	Scale PBL frameworks to other African countries; conduct mixed-methods studies for efficacy; foster partnerships between HEIs and industries for PBL curriculum design.

(Jackson et al., 2022)- Employer development of professional capabilities among early career workers and implications for the design of work-based learning	Explores employer roles in capability development; implications for work-based learning design; uses mixed methods for comprehensive analysis in Australian context.	Focused on early career workers in specific sectors; limited international perspectives; lacks focus on remote or gig work dynamics.	Adapt findings to global work-based learning programs; integrate with digital learning tools; research capability development in post-COVID hybrid work environments.
(Nakata et al., 2025)- The Road Home and Abroad: Enhancing TVET for Youth and Migration in Uzbekistan	Policy-oriented analysis on TVET for youth migration in Uzbekistan; addresses skill gaps for domestic and international labor markets; promotes sustainable development through education.	Uzbekistan-centric with limited comparative data; theoretical without extensive empirical testing; overlooks gender-specific migration challenges.	Extend to Central Asian migration corridors; develop migrant-focused TVET curricula; collaborate with international organizations for skill certification and portability.
(Jackson & Li, 2024) - Perceived skill outcomes among coursework and research graduates and evolution over time	Longitudinal analysis of skill perceptions among graduates; compares coursework and research pathways; highlights evolution in skill priorities over time.	Relies on self-perceived skills without employer validation; Australian focus may not generalize; limited to higher education graduates.	Incorporate employer feedback for validation; expand to vocational and non-traditional education; track skill evolution in response to technological advancements.
(Jackson & Tomlinson, 2026) - Employer perspectives on professional identity and its role in graduate recruitment	Qualitative insights from employers on professional identity in recruitment; bridges theory and practice in graduate employability; Australian-UK collaboration for broader relevance.	Limited to employer views without graduate perspectives; pre-2026 publication may miss recent trends; sector-specific biases possible.	Include graduate and educator viewpoints; explore identity in diverse cultural contexts; develop identity-building modules in higher education curricula.
(Mohan et al., 2025) - Cultivating socially sustainable employability in Industry 5.0: exploring the impact of specific skills on the employability of management graduates	Structural equation modeling on skills for Industry 5.0 employability; emphasizes social sustainability; practical implications for HEIs and employers in India.	India-focused on management graduates; self-reported data may introduce bias; limited to specific skills without broader competency frameworks.	Adapt to other disciplines and regions; integrate sustainability metrics in employability assessments; foster Industry 5.0 collaborations for skill development.
(Jackson & Tomlinson, 2020)- Investigating the relationship between career planning, proactivity and employability perceptions among higher education students in uncertain labour market conditions	Empirical analysis of student perceptions in Australian and UK contexts; explores links between labour market perceptions, self-perceived employability, career proactivity, and planning; highlights implications for career services in challenging markets.	Limited to two countries and self-reported data; focuses on perceptions rather than actual outcomes; sample size (N=433) may limit generalizability across disciplines.	Expand to global contexts or longitudinal studies on actual career outcomes; develop interventions to enhance career proactivity; integrate with digital career tools for uncertain markets.
(Harris & Clayton, 2020) - The value of vocational education and training	Editorial overview emphasizing VET's societal and economic value; draws on international perspectives; promotes policy and research discussions in VET.	Editorial format lacks original empirical data; broad scope without in-depth case studies; limited to 2020 publication context.	Foster interdisciplinary VET research; update for post-pandemic VET values; collaborate on global VET impact assessments.
(Jackson et al., 2024) - Student employability-building activities: participation and contribution to graduate outcomes	Examines participation in employability activities and their impact on outcomes; multi-institutional Australian focus; practical implications for higher education enhancement.	Australian-centric; self-reported outcomes may introduce bias; lacks long-term tracking of graduate success.	Comparative international studies; integrate AI-driven employability tools; design inclusive activities for diverse student groups.
(Jackson, 2024) - The relationship between student employment, employability-building activities and graduate outcomes	Analyzes interplay between student work, activities, and outcomes; highlights benefits and challenges; informs student support strategies in higher education.	Focused on Australian graduates; potential confounding variables in self-reports; limited to initial post-graduation outcomes.	Longitudinal research on long-term career impacts; explore gig economy student work; develop hybrid work-employability programs.
(Jackson & Cameron, 2026) - The role of extra-/co-curricular activities and work on law graduates' initial employment outcomes	Discipline-specific analysis for law graduates; examines extracurricular impacts on employment; Australian context with policy recommendations.	Limited to law field and initial outcomes; self-reported data; lacks comparison with other disciplines.	Expand to other professions; longitudinal outcome tracking; foster university-industry

			partnerships for extracurricular design.
(Marois et al., 2026) - Projecting Labour Market Imbalances and Skill Mismatch Under Demographic Change in the EU	Dynamic microsimulation for EU27 projections to 2060; assesses skill mismatches under demographic shifts; evaluates policy scenarios like immigration and retraining.	EU-focused projections; assumptions may not account for unforeseen events (e.g., pandemics); limited to macro-level analysis.	Adapt model to global regions; incorporate AI and climate impacts; inform EU policy on sustainable workforce strategies.
(Comyn, 2018) - Skills, employability and lifelong learning in the Sustainable Development Goals and the 2030 labour market	Links skills to SDGs and future markets; policy-oriented for global employability; emphasizes lifelong learning in 2030 agenda.	Conceptual focus without new empirical data; broad SDG scope may lack depth; 2018 publication predates recent global changes.	Update for post-2030 agendas; empirical SDG impact studies; develop LLL frameworks for emerging economies.
(Jackson & Dean, 2023) - The contribution of different types of work-integrated learning to graduate employability	Compares WIL types' impact on employability; Australian empirical evidence; practical guidance for curriculum design.	Australian context; focuses on perceptions rather than objective measures; limited sample diversity.	International WIL comparisons; integrate virtual WIL; research WIL in gig and remote work eras.
(Zineb et al., 2017). - The Application of the Competency-Based Approach to Assess the Training and Employment Adequacy Problem	Conceptual framework linking competency-based approach to job-training match; reviews global currents and Moroccan context; proposes referential line for curriculum revision.	Primarily theoretical with limited empirical validation; Morocco-focused, reducing generalizability; lacks quantitative analysis of implementation outcomes.	Test approach in diverse educational systems; integrate with digital tools for competency assessment; foster international collaborations for TVET curriculum standards.
(Polidano & Ryan, 2016) - Long-Term Outcomes from Australian Vocational Education	Longitudinal analysis of VET outcomes; uses robust data from Melbourne Institute; highlights economic and social benefits of vocational training.	Australia-specific; potential data limitations from 2016; overlooks post-pandemic shifts in VET impacts.	Update with recent data; comparative global VET studies; inform policy on VET funding and accessibility for underrepresented groups.
(Rice et al., 2025). - Vocational teachers in school settings: career pathways and motivations	Qualitative insights into vocational teachers' pathways; Australian focus on motivations and challenges; implications for teacher recruitment and retention.	Limited to school settings in Australia; small sample size; lacks international perspectives.	Expand to global teacher education models; develop training programs for vocational educators; research motivations in digital and inclusive education contexts.
(Jackson & Cook, 2025) - Work-integrated learning in the humanities, arts and social sciences: where to from here?	Review of WIL in HASS disciplines; identifies gaps and future directions; promotes interdisciplinary approaches for employability.	Conceptual with limited new data; Australian-centric; overlooks non-traditional WIL formats like virtual experiences.	Empirical studies on WIL efficacy in HASS; integrate AI and remote WIL; collaborate with industries for tailored HASS programs.
(Caballero et al., 2026). - Untangling graduate employability and work readiness to inform evidence-based practice in higher education	Conceptual clarification of employability vs. work readiness; evidence-based implications for HE practice; interdisciplinary Australian perspective.	Theoretical focus without primary empirical data; pre-2026 publication may miss recent trends; limited to HE contexts.	Develop measurement tools for readiness; longitudinal graduate tracking; integrate into global HE policy reforms.
(Ye et al., 2024) - Advancing digital transformation in TVET through international cooperation: Approaches by the UNESCO Chair on Digitalization in TVET	Case study of UNESCO Chair activities (2023-2024); identifies four cooperation approaches; highlights global dialogue and capacity building.	Limited to one-year period and specific Chair; China-focused initiatives; challenges like digital disparities not fully quantified.	Scale approaches globally; long-term impact evaluations; foster South-South cooperation in digital TVET.
(Subrahmanyam, 2025). - Developing green skills for sustainable careers	Empirical study using CSES on 800+ U.S. students; demonstrates CSSE improvements via required course; scalable strategy for diverse cohorts.	U.S.-specific; self-reported data bias; resource-limited setting may not generalize to well-funded institutions.	Adapt course to international HE; integrate experiential learning; research long-term employment outcomes.
(Teixeira et al., 2021) - The prevalence of occupational exposure to noise: A systematic review and meta-analysis from the WHO/ILO	Comparative analysis of global TVET teacher training; emphasizes integrated competencies; reviews political standards and initiatives.	Broad overview without in-depth case studies; lacks quantitative data; focuses on trends up to 2025.	Develop competency frameworks; empirical testing of integrated models; promote UNESCO-led global

Roles of Career Guidance in Strengthening Link and Match Between Vocational Education and Labor Market Needs

The synthesis demonstrates that career guidance has a key part to play in enhancing the linkage between VET outcomes and labour market needs. Career guidance acts as a bridging tool which helps to connect students and new entrants with industry demands, labour market directions, and professional careers' pathways.

There is evidence suggesting that well-organized career guidance programmes can enhance students' career planning skills, career self-efficacy and employability perceptions (Panzai, 2019). Furthermore, career counseling has the positive effect of decreasing skill mismatch because it allows to inform students about the labor market and give them early work experience.

Career adaptability is also highlighted in the literature as one of the vital career guidance effects. Students who partake in career and development-based programs are more resilient, adaptable and responsive to technological change and changing workforce needs. Such findings may contribute to the strategic aim of career guidance in aiding vocational education systems to stay relevant to the labor market.

Effective Career Guidance Models for Improving Employability and Career Readiness

The systematic literature review synthesizes empirical evidence to identify career guidance models that have demonstrated effectiveness in strengthening employability outcomes and career readiness among vocational training center (VTC) students.

Work-Integrated Learning Model

The Work-Integrated Learning (WIL) model, in particular, is widely considered as a key strategy. This model is based on an experiential learning through internships and apprenticeships with project-based engagement in industry. Evidence suggests that WIL leads to an increase in professional capacity, development of practical skills and confidence among students in practice entry (Billett, 2025; Jackson & Cook, 2025).

Competency-Based Career Guidance

Competency-based career guidance seeks to relate the content of curricula in vocational and technical fields to industry/skills standards. This means that students are better equipped to meet the demands of the workplace, and employability is fostered through this combination of technical expertise with transferable skills during career development programmes.

Online and AI Powered Career Guidance

The provision of career guidance service is increasingly

being delivered through the utilization of digital technology and artificial intelligence. One way to do this is through data-driven career advice systems which allow for individualized career planning and up-to-date labor market information, enabling students to make informed career decisions.

Positive Psychology and the Career Adapt-abilities Approach

A few researches show the use of positive psychology theory in career counseling. It highlights psychological well-being, career resilience and self-awareness as critical to long-term career sustainability. Such approaches seem to contribute and support in enhancing the students' motivation and career decision-making.

Challenges and Barriers in Implementing Career Guidance

The key role of the career guidance in vocational education Once its value is acknowledged, however, many obstacles have to be overcome for career guidance to work in vocational education.

One significant challenge is the absence of coherent linkage among policy frameworks, curriculum development, and institutional practices (Godden, 2022; Robertson, 2018b, 2018a). However, in most cases of these and other countries national level career guidance policies which have been developed is not yet appropriately translated into implementation at institutional levels.

A second challenge is in terms of personnel capacity, and specifically a shortage of trained career counselors and vocational educators with advanced knowledge in career development. Inadequate access to professional development also limits program impact.

Variabilities in technology are also implementation related. As the world of work is redefined there are vocational education service providers that have not fully incorporated digital careers guidance into their portfolios.

It also weakens the possibilities of sound career counselling on the part of counselling services by not having current and verifiable labour market information, which makes ineffective any job search process that is meant to lead towards an updated matching.

Future Directions for Strengthening Career Guidance in Vocational Education

The studies reviewed indicate a number of strategic dimensions related to the improvement of career guidance quality in vocational education.

First, the use of digital technology and artificial intelligence is broadly advocated in regard to (a) supporting personalized career guidance services; and (b) enhancing access to labor market information.

Second, building relationships between vocational education providers and industry is seen as a key enabler of curriculum relevance and authentic workplace learning

opportunities.

Thirdly, the necessity for promoting lifelong learning-focused career guidance frameworks is growing so that people can take charge of their own careers in the process of career mobility and dynamic competence development amid rapid technological change (Carney, 2022; Frey & Osborne, 2017; Hughes et al., 2021).

Fourth, capacity-building of vocational teachers and career counselors such as on-the-job training and professional enhancement programs is required for better service quality.

Finally, there is a need for nation-wide policy frameworks which uniformly incorporate career guidance into the vocational education systems that are critical to sustainability and long-term alignment with the labor market.

Career Guidance as a Strategic Workforce Alignment Mechanism

The synthesis of the reviewed studies provides a comprehensive overview of how career guidance contributes to strengthening alignment between vocational education and labor market demands. The literature indicates that career guidance is increasingly conceptualized not merely as a counseling activity but as a strategic institutional mechanism that facilitates the transition from education to employment and supports workforce readiness. Several studies emphasize that structured career guidance programs provide students with access to labor market information, occupational pathways, and career decision-making support, which may improve their preparedness for employment (Hooley, Sultana, & Thomsen, 2018; OECD, 2021). From a theoretical perspective, these findings align with the principles of Human Capital Theory, which emphasizes that education and training systems should develop competencies that contribute to productivity and employability in the labor market (Becker, 1993). The literature suggests that career guidance can help students interpret labor market signals, understand occupational requirements, and align their skill development with employment opportunities (Cedefop, 2020). However, the findings also suggest that workforce readiness is not determined solely by technical skill acquisition. The reviewed studies highlight the importance of career adaptability, psychological readiness, and lifelong learning capabilities as complementary dimensions of employability. From this perspective, the present synthesis extends the traditional human capital view by emphasizing that employability development involves both competency development and career self-management capacities (Savickas et al., 2009).

Theoretical Positioning in Career Development Frameworks

The findings can also be interpreted through several theoretical frameworks commonly used in career development research. First, the reviewed studies provide

support for Social Cognitive Career Theory (SCCT), which emphasizes the role of self-efficacy, outcome expectations, and personal interests in shaping career decisions (Lent, Brown, & Hackett, 1994). Several studies included in the review report that structured career guidance programs may enhance students' career self-efficacy and confidence in navigating complex labor markets. Second, the results are consistent with Career Construction Theory, which conceptualizes career development as an adaptive and meaning-making process influenced by changing social and economic environments (Savickas, 2013). The emphasis on career adaptability, self-awareness, and resilience observed in many of the reviewed studies reflects this theoretical perspective, particularly in the context of rapidly evolving labor markets and technological change. Third, the findings are also aligned with the Lifelong Learning paradigm, which views career development as a continuous process rather than a one-time transition from school to work (OECD, 2019). The increasing integration of digital career guidance platforms and competency-based learning approaches suggests that vocational graduates must continually update their skills and career knowledge in response to evolving labor market demands. Taken together, these theoretical perspectives suggest that career guidance in vocational education should be understood as a multidimensional system that supports both individual career development and broader workforce alignment processes.

Career Guidance Models Associated with Employability Development

The synthesis also identifies several career guidance approaches that are frequently associated with improved employability outcomes in vocational education contexts. One of the most widely discussed approaches is Work-Integrated Learning (WIL), which provides students with opportunities to gain practical experience through direct engagement with industry partners. Consistent with Experiential Learning Theory (Kolb, 1984), WIL programs allow students to apply theoretical knowledge in real workplace contexts, which may contribute to stronger professional competencies and career readiness. Similarly, competency-based career guidance models emphasize the development of clearly defined skills aligned with occupational standards and industry requirements. These models are often linked with Outcome-Based Education frameworks, which prioritize measurable learning outcomes and competency development (Spady, 1994).

The reviewed literature suggests that integrating career guidance with competency-based curricula may support stronger alignment between vocational training and employer expectations. In addition, the digital transformation of career services is increasingly highlighted in the literature. The emergence of digital and AI-enabled career guidance platforms reflects broader developments in technology-enhanced learning and digital labor market intermediation (Hooley, 2020). These systems can provide personalized career information, real-time labor market data, and automated job-matching tools that may enhance access to

career guidance services and support more informed career decisions. Finally, several studies highlight the relevance of positive psychology perspectives in career guidance. Programs that emphasize motivation, well-being, and resilience may contribute to sustainable career development and long-term employability (Seligman, 2011).

Institutional and Structural Challenges

Despite the potential contributions of career guidance, the reviewed literature also identifies several structural challenges that may limit its effectiveness. One commonly reported issue is the gap between policy design and implementation. While many countries have developed national career guidance strategies, the practical implementation of these policies within educational institutions often remains inconsistent (OECD, 2021). From a systems perspective, vocational education can be conceptualized as an interconnected ecosystem involving educational institutions, industry actors, and policy governance structures. Drawing on Open Systems Theory and the Socio-Technical Systems approach, misalignment between these subsystems may lead to skill mismatch and inefficient school-to-work transitions (Katz & Kahn, 1978; Trist, 1981).

In this context, career guidance can function as a coordinating mechanism that facilitates information exchange and alignment between educational outcomes and labor market needs. Another frequently reported challenge relates to resource constraints. Many vocational education systems face shortages of qualified career counselors and limited professional development opportunities, which may affect the quality and accessibility of career guidance services (Cedefop, 2020). Technological inequality also represents a significant barrier. Although digital career guidance systems offer opportunities for expanding access to career services, disparities in digital infrastructure and technological resources may limit their effectiveness, particularly in developing regions.

Policy and Reform Implications

The findings suggest that strengthening career guidance requires broader policy and institutional reforms within vocational education systems. One important implication is the need to embed career development more systematically within vocational curricula, rather than treating career guidance as a peripheral support service. Integrating career guidance within teaching and learning processes may enhance students' career awareness, professional identity development, and lifelong learning capabilities. In addition, stronger collaboration between vocational institutions and industry partners appears to be essential for effective career guidance. Industry partnerships can provide valuable labor market insights, support work-based learning opportunities, and help vocational institutions align their training programs with evolving workforce demands. Such collaboration reflects

the principles of the Triple Helix Model, which emphasizes interaction between universities, industry, and government in promoting innovation and workforce development (Etzkowitz & Leydesdorff, 2000). Furthermore, the ongoing digitalization of career guidance presents new opportunities for improving the efficiency and accessibility of career services. AI-enabled labor market analytics and digital career platforms may facilitate more accurate career matching and support data-driven workforce planning.

Limitations

Despite providing valuable insights, this review has several limitations. First, the literature search was limited to five major academic databases, which may have excluded relevant studies published in other regional or specialized databases. Second, only English-language publications were included, which may introduce language bias and limit the representation of studies conducted in non-English-speaking contexts. Third, the reviewed studies exhibit considerable heterogeneity in research design, methodology, and measurement of employability outcomes, which restricts direct comparability across studies. Finally, although the review followed PRISMA guidelines for systematic literature reviews, a formal methodological quality appraisal of the included studies was not conducted. As a result, the strength of the synthesized evidence should be interpreted with caution. Future research may benefit from conducting empirical studies that examine the long-term impact of career guidance interventions on vocational graduates' employment outcomes, as well as comparative analyses across different national vocational education systems.

Conclusion

This systematic review of the literature collates evidence concerning the impact of career guidance in enhancing links between the outcomes of vocational education and training (VET) and the skill demands of work. The synthesis of the reviewed studies suggests an emerging reconceptualization of career development (CD) from a predominantly counseling-oriented function toward a more integrated and strategic educational instrument supporting employability, career adaptability, and workforce readiness. This transfer of technical competence, generic skills and career planning strategies is an important means by which career guidance can help to enhance the relevance, speed of response in pedagogy and content nature of VET systems.

The review shows that strong career guidance nurtures the connection and fit between VET and industry by promoting students' career awareness, professional identity development and navigation of changing job markets. Of the several options explored Work-Integrated Learning, competencies-based career development and digital career guidance systems stand out as the most successful methodologies with which to enhance employability and career readiness. These approaches

represent a move to more learner-centered, experience-based and data-driven career development models that are better suited to today's workforce needs.

Theoretically, we have provided an incorporation of Human Capital Theory, Social Cognitive Career Theory, Career Construction & Lifelong Learning views attempting to account for the multidimensional nature of career guidance in VET. The results suggest that workforce readiness are related to technical preparation but also emotional preparedness, flexibility and capacity for lifelong learning.

In view of its strategic importance, the review finds a range of implementation constraints which impede the use of career guidance services, including weak policy-practice linkage; limited skill base for career counseling and vocational teaching (facilitat(ing) to their assimilation into ever growing global market structures?); digital inequality and requisite ICT infrastructure and labor-market information deficits. They are a barrier and one that signifies the requirement of systemic reform that integrates educational institutions, industry players and policy makers.

This research implies that as policy, vocational education in the future should incorporate career guidance in both curriculum development and workforce planning. Improving vocational education outcomes and supporting sustainable workforce development will require deepening industry partnerships, incorporating digital career guidance technology, and chasing a lifelong learning approach to career development framework.

More empirical and longitudinal research is needed to examine long-term effects of career guidance programs on successful transition from education to work, career advancement, and sustainable entry into the labor market. Furthermore, studies on incorporating artificial intelligence and labor market analytics in career guidance delivery might shed some light on personalized career development and workforce planning.

In summary, this review highlights the crucial role of career guidance in vocational education reform and its roles in equipping graduates to adjust efficiently into quickly changing labor market contexts.

References

- Areisy, H. J., & Sudira, P. (2022). Employability skills of state vocational high school students on welding engineering expertise competency. *Jurnal Pendidikan Vokasi*, 12(1), 53–63. <https://doi.org/10.21831/jpv.v12i1.41764>
- Billett, S. (2025). Constituting integration in work-integrated education and learning. *Studies in Continuing Education*, 47(3), 513–530. <https://doi.org/10.1080/0158037X.2024.2363262>
- Billett, S. (2026). *Contemporary Purposes for Vocational Education* (pp. 255–278). https://doi.org/10.1007/978-3-032-04410-5_11
- Caballero, C. L., Hansen, L., Walker, A., Rosenberg, C., Orr, P., Claringbold, G., Sturre, V. L., & Forsyth, L. (2026). Untangling graduate employability and work readiness to inform evidence-based practice in higher education. *Higher Education Research & Development*, 1–18. <https://doi.org/10.1080/07294360.2026.2615303>
- Carney, S. (2022). Reimagining our futures together: a new social contract for education. *Comparative Education*, 58(4), 568–569. <https://doi.org/10.1080/03050068.2022.2102326>
- Comyn, P. J. (2018). Skills, employability and lifelong learning in the Sustainable Development Goals and the 2030 labour market. *International Journal of Training Research*, 16(3), 200–217. <https://doi.org/10.1080/14480220.2018.1576311>
- Di Fabio, A., Svicher, A., Palazzeschi, L., & Gori, A. (2022). Revitalising career counseling for sustainable decent work and decent lives: From personality traits to life project reflexivity for well-being. *Cypriot Journal of Educational Sciences*, 17(5), 1468–1476. <https://doi.org/10.18844/cjes.v17i5l.1.6675>
- Dodd, V., Hooley, T., & Burke, C. (2019). Decent work in the UK: Context, conceptualization, and assessment. *Journal of Vocational Behavior*, 112, 270–281. <https://doi.org/10.1016/j.jvb.2019.04.002>
- Duarte, M. E., da Silva, J. T., & Paixão, M. P. (2017). Career adaptability, employability, and career resilience in managing transitions. In *Psychology of Career Adaptability, Employability and Resilience* (pp. 241–261). Springer International Publishing. https://doi.org/10.1007/978-3-319-66954-0_15
- Frey, C. B., & Osborne, M. A. (2017). The future of employment: How susceptible are jobs to computerisation? *Technological Forecasting*

Author contributions

All authors contributed significantly to the development of this study. Conceptualization and research design were carried out by the first author, who was responsible for formulating the research objectives, research questions, and overall study framework. The first author also conducted the systematic literature search, data screening, and data extraction processes following the PRISMA guidelines.

The second author contributed to methodological validation, thematic synthesis, and interpretation of findings. Additionally, the second author provided critical revisions to strengthen theoretical positioning and analytical rigor.

The third author supported data analysis, manuscript drafting, and literature verification to ensure the accuracy and consistency of references and academic writing quality.

All authors participated in reviewing, editing, and approving the final version of the manuscript and agreed to be accountable for all aspects of the work.

Acknowledgements

The authors would like to express their sincere appreciation to the Department of Culinary Arts Education, Faculty of Engineering, State University of Malang, and the individuals who contributed to the completion of this study. The authors are especially grateful to their academic supervisors, colleagues, and reviewers who provided valuable input and constructive suggestions that helped improve the quality of this research.

The authors also acknowledge the support of institutions that provided access to scientific databases and academic resources, which were essential for conducting a systematic literature review.

Furthermore, the authors extend their gratitude to all researchers whose scientific work formed the basis of this study. Their contributions have significantly enriched the development of knowledge in vocational education and career guidance research.

- and *Social Change*, 114, 254–280. <https://doi.org/10.1016/j.techfore.2016.08.019>
- Godden, L. (2022). Career guidance policy documents: translation and usage. *British Journal of Guidance and Counselling*, 50(1), 157–169. <https://doi.org/10.1080/03069885.2020.1784843>
- Haasler, S. R., & Barabasch, A. (2015). The role of learning and career guidance for managing mid-career transitions – comparing Germany and Denmark. *British Journal of Guidance and Counselling*, 43(3), 306–322. <https://doi.org/10.1080/03069885.2015.1020758>
- Harris, R., & Clayton, B. (2020). The value of vocational education and training. In *International Journal of Training Research* (Vol. 18, Number 3, pp. 185–190). Routledge. <https://doi.org/10.1080/14480220.2020.1860309>
- Hughes, D., Warhurst, C., Bengler, E., & Ifans, M. (2021). Building better futures: decent work, inclusion and careers support services in the UK. *British Journal of Guidance and Counselling*, 49(2), 213–227. <https://doi.org/10.1080/03069885.2021.1900537>
- Ivanov, S., & Webster, C. (2019). Information and Communication Technologies in Tourism 2019. In *Information and Communication Technologies in Tourism 2019* (Vol. 1). Springer International Publishing. <https://doi.org/10.1007/978-3-030-05940-8>
- Jackson, D. (2024). The relationship between student employment, employability-building activities and graduate outcomes. *Journal of Further and Higher Education*, 48(1), 14–30. <https://doi.org/10.1080/0309877X.2023.2253426>
- Jackson, D., & Cameron, C. (2026). The role of extra-/co-curricular activities and work on law graduates' initial employment outcomes. *Higher Education Research and Development*, 45(1), 156–172. <https://doi.org/10.1080/07294360.2025.2482807>
- Jackson, D., & Cook, E. J. (2025). Work-integrated learning in the humanities, arts and social sciences: where to from here? *Studies in Higher Education*, 50(9), 2048–2067. <https://doi.org/10.1080/03075079.2024.2409879>
- Jackson, D., & Dean, B. A. (2023). The contribution of different types of work-integrated learning to graduate employability. *Higher Education Research and Development*, 42(1), 93–110. <https://doi.org/10.1080/07294360.2022.2048638>
- Jackson, D., Lambert, C., Sibson, R., Bridgstock, R., & Tofa, M. (2024). Student employability-building activities: participation and contribution to graduate outcomes. *Higher Education Research and Development*, 43(6), 1308–1324. <https://doi.org/10.1080/07294360.2024.2325154>
- Jackson, D., Lambert, C., Tofa, M., Bridgstock, R., & Sibson, R. (2025). Career resources and securing quality work: graduate perspectives. *Studies in Continuing Education*, 47(2), 436–456. <https://doi.org/10.1080/0158037X.2024.2410182>
- Jackson, D., & Li, I. (2024). Perceived skill outcomes among coursework and research graduates and evolution over time. *Journal of Further and Higher Education*, 48(4), 449–466. <https://doi.org/10.1080/0309877X.2024.2346742>
- Jackson, D., Shan, H., & Meek, S. (2022). Employer development of professional capabilities among early career workers and implications for the design of work-based learning. *International Journal of Management Education*, 20(3). <https://doi.org/10.1016/j.ijme.2022.100692>
- Jackson, D., & Tomlinson, M. (2020). Investigating the relationship between career planning, proactivity and employability perceptions among higher education students in uncertain labour market conditions. *Higher Education*, 80(3), 435–455. <https://doi.org/10.1007/s10734-019-00490-5>
- Jackson, D., & Tomlinson, M. (2026). Employer perspectives on professional identity and its role in graduate recruitment. *Studies in Higher Education*, 1–20. <https://doi.org/10.1080/03075079.2026.2616618>
- Kolawole, B., Peter, O., & Fausat, O. (2025). *Industrial Education as a Tool for Developing Vocational Skills*. <https://doi.org/10.5281/zenodo.17218176>
- Marois, G., Potančoková, M., Bezat, A., & Crespo Cuaresma, J. (2026). Projecting Labour Market Imbalances and Skill Mismatch Under Demographic Change in the EU. *European Journal of Population*, 42(1). <https://doi.org/10.1007/s10680-025-09758-2>
- Mohan, M., Sharma, P., & Dana, L. P. (2025). Cultivating socially sustainable employability in Industry 5.0: exploring the impact of specific skills on the employability of management graduates. *Education and Training*, 1–20. <https://doi.org/10.1108/ET-03-2024-0105>
- Nakata, S., Wang, K., Kalbfuss, M., & Fasih, T. (2025). *The Road Home and Abroad: Enhancing TVET for Youth and Migration in Uzbekistan*.
- Nilsson, S. (2017). Employability, Employment and the Establishment of Higher Education Graduates in the Labour Market. In *Graduate Employability in Context* (pp. 65–85). Palgrave Macmillan UK. https://doi.org/10.1057/978-1-137-57168-7_3
- Okolie, U. C., Elom, E. N., Igwe, P. A., Binuomote, M. O., Nwajibu, C. A., & Igu, N. C. N. (2021). Improving graduate outcomes : Implementation of problem-based learning in TVET systems of Nigerian higher education. *Higher Education, Skills and Work-Based Learning*, 11(1), 92–110. <https://doi.org/10.1108/HESWBL-12-2018-0140>
- Ong, X. Q., & Lim, K. H. (2023). *SkillRec: A Data-Driven Approach to Job Skill Recommendation for Career Insights*. <http://arxiv.org/abs/2302.09938>
- Pavlova, M. (2019). Emerging environmental industries: impact on required skills and TVET systems. *International Journal of Training Research*, 17(sup1), 144–158. <https://doi.org/10.1080/14480220.2019.1639276>
- Pavlova, M., & Askerud, P. (2024). A Euro-Asian look at challenges to innovation and the greening of industries: implications for TVET and strategic policy formulation. *Journal of Vocational Education and Training*, 76(2), 381–405. <https://doi.org/10.1080/13636820.2023.2288055>
- Peter, D., Peter, M., & Peter, P. (2025). Mapping the landscape of TVET education: a global bibliometric analysis. *Asian Education and Development Studies*. <https://doi.org/10.1108/AEDS-07-2024-0141>
- Polidano, Cain., & Ryan, Chris. (2016). *Long-term outcomes from Australian vocational education*. Melbourne Institute of Applied Economic and Social Research.
- Powell, L., Muronda, F., & Tini, S. (2024). *Student demand for TVET colleges*.
- Rice, S., Gillis, S., Dawborn-Gundlach, M., van Driel, J., Koh, S., & Speldewinde, C. (2025). Vocational teachers in school settings: career pathways and motivations. *Journal of Vocational Education and Training*, 77(4), 958–981. <https://doi.org/10.1080/13636820.2024.2372773>
- Robertson, P. J. (2018a). Developing career capabilities in “NEET” young people: experiences of participants in the Prince’s Trust team programme. *British Journal of Guidance and Counselling*, 46(6), 752–764. <https://doi.org/10.1080/03069885.2018.1434130>
- Robertson, P. J. (2018b). Positive psychology and career development. *British Journal of Guidance and Counselling*, 46(2), 241–254. <https://doi.org/10.1080/03069885.2017.1318433>
- Rudolph, C. W., Zacher, H., & Hirschi, A. (2019). Empirical developments in career construction theory. In *Journal of Vocational Behavior* (Vol. 111, pp. 1–6). Academic Press Inc. <https://doi.org/10.1016/j.jvb.2018.12.003>
- Sharma, S., & Sharma, R. (2019). Culinary skills: the spine of the Indian hospitality industry: Is the available labor being skilled appropriately to be employable? *Worldwide Hospitality and Tourism Themes*, 11(1), 25–36. <https://doi.org/10.1108/WHATT-10-2018-0061>
- Soproni, Z. (2023). Employability Skills. *GfE Journal of Skills Development*, 3(2), 53–65. <https://doi.org/10.52398/gjsd.2023.v3.i2.pp53-65>
- Souto-Otero, M., Brown, P., & Freebody, S. (2023). High skilled workplaces, technological change and employment: Can educational reform do it? *International Journal of Educational Research*, 122. <https://doi.org/10.1016/j.ijer.2023.102265>
- Subrahmanyam, S. (2025). Developing green skills for sustainable careers. In *Integrating AI and Sustainability in Technical and Vocational Education and Training (TVET)* (pp. 101–126). IGI Global. <https://doi.org/10.4018/979-8-3373-1142-5.ch005>
- Teixeira, L. R., Pega, F., de Abreu, W., de Almeida, M. S., de Andrade, C. A. F., Azevedo, T. M., Dzhambov, A. M., Hu, W., Macedo, M. R. V., Martínez-Silveira, M. S., Sun, X., Zhang, M., Zhang, S., & Correa da Silva, D. T. (2021). The prevalence of occupational exposure to noise: A systematic review and meta-analysis from the WHO/ILO Joint Estimates of the Work-related Burden of Disease and Injury. *Environment International*, 154. <https://doi.org/10.1016/j.envint.2021.106380>
- Yakubu, A., & Bayong, D. (2025). Addressing the Skills Gap: Alignment of Technical and Vocational Education and Training (TVET) with Industry Demand in Ghana’s Hospitality Sector. In *Universal Journal of Educational Research* (Vol. 4, Number 1). www.ujer.org
- Ye, J. H., He, Z., Bai, B., & Wu, Y. F. (2024). Sustainability of Technical and Vocational Education and Training (TVET) along with Vocational Psychology. In *Behavioral Sciences* (Vol. 14, Number 10). Multidisciplinary Digital Publishing Institute (MDPI). <https://doi.org/10.3390/bs14100859>
- Yildiz, R. (2020). Handbook of Research on Educational Communications and Technology. In *Contemporary Educational Technology* (Vol. 1, Number 1). <https://doi.org/10.30935/cedtech/5962>
- Zineb, A. H., Soumia, B., Souad, A., & Karim, G. (2017). The Application of the Competency Based Approach to Assess the Training and Employment Adequacy Problem. *International Journal of Education (IJE)*, 5(1), 01–18. <https://doi.org/10.5121/ije.2017.5101>