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Career guidance and industrial internship mechanisms and their effects on career readiness in technical and vocational education and training: a systematic literature review (2020–2026)

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ABSTRACT

The purpose of this comprehensive literature review critically synthesizes evidence on how industrial internships, work-based learning, and career guidance practices are experienced by students in vocational education and how these practices, in turn, influence students' career readiness and employability outcomes. The review process followed the PRISMA 2020 reporting framework standards. An initial pool of 401 documents was gathered from the Scopus database on 6 July 2026. The search was done using a Boolean string. After filtering out, 257 items were considered for further screening. After the screening and a full-text eligibility check against a structured inclusion/exclusion matrix and a FICO (Focus, Information, Context, Outcome) quality threshold (scored 0-8, with a minimum composite of 4 required for inclusion), 50 articles were deemed suitable for thematic synthesis using Thomas and Harden's thematic approach, with 10 leading examples being illustrated in depth. Screening and eligibility decisions were done by following one set of rules instead of using two raters who would check each other's work. This is a methodological limitation that is further discussed in the full text. Thematic synthesis grouped by three research questions shows that (1) work-based learning models are extensively used for converting vocational curricula into competences relevant to work; (2) personal attributes such as career self-confidence, career resilience, and clear vocational identity, combined with external factors like good teaching, industry exposure, and social support, not only influence students' career decisions but also their ability to find employment during internship; and (3) well-designed career guidance and counselling services, which are part of institutional industry link-and-match partnerships, seem to have a positive impact on school-to-work transition outcomes, although guidance services are still very much scattered and hardly evaluated in many countries. From a practitioner's perspective, the review suggests that formalizing internship supervision, incorporating career counseling into vocational courses at the beginning, and reinforcing the industry-school partnership mechanisms are some of the ways forward.

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Introduction

Both in industrialised and developing countries, moving from formal education to a stable and skilled job has become one of the major problems for education systems (Hassan et al., 2021; Yao et al., 2024). Besides rapid

technological change, labour markets are changing due to the changing demand of different sectors of the economy and the continuous mismatch of the competences produced by schools with the ones required by employers (Usman, 2026; Spöttl & Windelband, 2021). More and more governments are treating technical and vocational education and training (TVET) as an effective measure to tackle youth unemployment, and at the same time, improve the competitiveness of their countries. Vocational schools are regarded as places where students are connected with the labour market (Kharel et al., 2026; Amegah, 2023). Against this international background, the question of how vocational institutions prepare their students for the working world, i.e. through curriculum development, cooperation with industry, and planned career guidance, is gaining a lot of attention from policy and research.

Industrial internship and career guidance are very important aspects of the larger context. Vocational students are exposed directly to workplace routines, technologies, and professional norms through industrial internship, also called work-based learning or apprenticeship (Sutiman et al., 2022; Amin et al., 2020). Career guidance, on the other hand, consists of the counselling and informational support that aim to assist students in making sense of that exposure, working out their career goals, and making the right choices about further study or employment (Gruzina et al., 2023; Okolie et al., 2020a). By functioning together and being well planned, these two tools can lead to student acquiring workplace-ready competence through vocational curricula and finding career directions that last (Rosidah & Sutirman, 2023; Silitonga, 2021). On the other hand, internships could simply turn into administrative procedures that do not offer any significant career-development opportunities if they are not well coordinated (Shodipe et al., 2025).

Graduate employability and work-integrated learning have been the focus of a significant amount of research. Authors have looked into how work-integrated learning forms part of professional curricula (Jackson & Meek, 2020), how short, intensive problem-based learning sessions develop employability skills (Wyke et al., 2022), and the encouragement of graduate career development through the combination of career training and mentoring (Okolie et al., 2020b). Reviews of graduate employability interventions indicate that experiential, practice-based elements tend to have better employment results than those carried out in classrooms only (de Boer et al., 2025). More specifically, within TVET, teaching-factory models, where students do production or service work in school-based enterprises that simulate real industrial conditions, have been highlighted in literature as a practical approach to aligning curriculum and workplace requirements (Prianto et al., 2025; Anwar et al., 2023).

The latest research, instead of simply showing the existence of these relationships, has started exploring the mechanisms by which these relationships are established and the factors that can influence them. Career adaptability and career self-efficacy are two important psychological factors that connect exposure to internships or work-based learning to employability confidence (Shen et al., 2024; Yao et al., 2024; Suyitno et al., 2025). According to research, vocational students' career self-efficacy and later career adaptability are influenced by the quality of teaching and social support during training (Mahfud et al., 2022), and it has also been found that geographic location and industry proximity can influence how internship and employability skills lead to career success (Hong, 2025). The skills agenda is being reshaped by digital transformation as well, with multiple studies highlighting how information and communication technologies are being incorporated into TVET curricula and workforce-readiness models (Hassan et al., 2021; Yoto et al., 2024; Kholifah et al., 2025a).

Even with the significant increase in publications, a major issue is the disintegration of the research base on career guidance itself. Most of the time career guidance is just considered as a background variable or a single survey item and not as a structured, evaluable intervention with identifiable components (Gruzina et al., 2023; Romero-Rodríguez et al., 2022). In case the provision of guidance is the main focus of the study, such studies often leave out the analysis of internships that the students have and if guidance and internships complement each other, in that case, it is not clear how the interaction of guidance and workplace exposure influences career decision-making (Staunton, 2022; Romanova, 2022). This kind of fragmentation makes the situation harder for policymakers who want to figure out which specific guidance practices timing, format, provider, integration with industry lead to stronger transition outcomes.

Taken all in all, these studies reveal a particular, unsettled question that needs to be resolved: While industrial internship/work-based learning and career guidance are each studied in depth as distinct constructs, only very few studies actually articulate or empirically test how the two factors can interact to jointly create career readiness, and there is no systematic synthesis to date that has mapped this joint knowledge base via a transparent, replicable protocol. This review fills this gap straightaway. In line with this review, career readiness is operationally defined as the combination of psychological characteristics (e.g., career self-efficacy, career adaptability, vocational identity clarity) and observable workplace competences which, taken together, are indicators of a successful graduation from vocational education into work.

One more divide is methodological and theoretical. Most of the existing data are cross-sectional, single-country, and dependent on self-reported measures of employability or satisfaction, which makes it difficult to determine causality of how internship and guidance together lead to career readiness (Wang et al., 2024; Banerjee et al., 2024). There is also a lack of theoretical framing: some researchers rely on career construction theory, others on human capital or social cognitive career theory, and some do not have any theoretical base at all, which makes it difficult to build a cumulative knowledge across the field (Donald et al., 2020; Madi et al., 2025). Comparative research on different national TVET systems which are quite different in terms of internship regulation, resourcing, and supervision is also scarce (Marijani et al., 2023; Coñoman et al., 2024).

Considering that governments and institutions keep making huge investments towards infrastructures of internship and career guidance, and on the other hand, youth have been increasingly going from one job to another (especially informal jobs or jobs with no security) and this has become a huge concern among people, the first thing we need to do now is that we need to carry out a methodical, PRISMA-guided synthesis of this evidence (Waiba, 2025; Alera et al., 2026). Such a synthesis would compile the accumulated empirical knowledge about internship and career guidance, including the identification of their target groups, the institutional conditions under which they function, and the clarification of the areas where the evidence is scarce. This paper meets that requirement by systematically mapping and analyzing the recent peer-reviewed articles on industrial internship and career guidance in vocational and technical education.

Therefore, this review is based on three research questions. The first deals with the ways in which internships and work-based learning are organized and carried out in vocational contexts. Responding to this question helps to provide a unified view of the prevalent models such as teaching factories, structured on-the-job training, industrial internship schemes, that are reported in recent literature (Sutiman et al., 2022; Rajamanickam et al., 2025; Saputra et al., 2024).

RQ1: *What are the structure and implementation of industrial internship and work-based learning practices within technical and vocational education and training settings?*

The second question moves beyond the structure and focuses on the mechanism, asking what personal and environmental factors influence students' making of career decisions and their employability during and after internship experiences. To answer this question, one has to bring together the research on career self-efficacy, career adaptability, vocational identity, learning quality, and industry interaction (Mahfud et al., 2022; Shen et al., 2024; Yusop et al., 2023), thereby providing a picture of the psychological and institutional ways through which the exposure to work environment turns into career readiness.

RQ2: *Which personal and environmental factors affect vocational students' career choices and their employability results throughout their industrial internship and work-based learning periods?*

The third question looks at the place and power of career guidance offering, and the obstacles that reduce its influence on the transition from school to work. The answer to this question is mainly based on the research on career guidance process enhancement, industry-school link-and-match partnerships, and school-to-work transition programmes (Gruzina et al., 2023; Yoto et al., 2024; Kharel et al., 2026). The three research questions together help make this review capable of providing a fresh, unified explanation of internship and guidance as two complementary, instead of separate, ways of vocational career development, and also making it possible to pinpoint the tangible gaps for primary research that can be carried out in the future.

RQ3: *What role does career guidance play, and what are the challenges, in supporting vocational education students' transition from school to work?*

Method

Research Design and Framework

This work uses systematic literature review (SLR) as the research design. The reason is that it offers a way of exposing clearly, repeating, and the least possible bias way of assembling the scattered empirical evidences on a specified research question compared to narrative reviews (Tranfield et al., 2003). The review is done based on the reporting framework first established for health research by Liberati et al. (2009) and later updated as the PRISMA 2020 statement (Page et al., 2021) that breaks down the review work into the steps of identification, screening, eligibility, and inclusion, and insists on transparent reporting of the number of records dealt with at each stage. This study protocol was not officially registered in advance (e.g., in PROSPERO) even though it isn't a requirement for all systematic reviews. The lack of registration is admitted here as a drawback of protocol transparency (see Section 5.5).

Search Strategy
Boolean search string below was used in Scopus on Title, Abstract and Keywords field: TITLE-ABS-KEY(("career guidance" OR "career counsel*" OR "career development") AND ("industrial internship" OR "work-based learning" OR "work-integrated learning" OR apprenticeship) AND ("vocational education" OR "vocational high school" OR TVET OR "technical and vocational education and training") AND ("career readiness" OR employability OR "career adaptability")). Truncation (*) was used on 'counsel*' to capture both 'counseling' and 'counselling'. No date limiter was applied at the search stage; document type, language, and DOI-availability limiters were applied during eligibility screening rather than at the search stage, to avoid prematurely excluding potentially relevant records.

Database and Information Sources
Scopus was the only bibliographic database relied upon in this review, mainly because of its extensive and comprehensive coverage across different disciplines such as education, social sciences, and applied sciences which are very relevant to TVET and career development research. The search was carried out on 6 July 2026. We recognize that we did not search additional databases (e.g., Web of Science, ERIC) and we have therefore highlighted this in Section 5.5 as a shortcoming.

Eligibility Criteria
Table 1 shows the criteria for including and excluding that were used when screening and assessing full-text.

Table 1 <Inclusion and Exclusion Criteria>

Criterion	Inclusion	Exclusion
Language	English	Non-English (n = 7 removed: Russian, Korean, Chinese)
Document type	Article, Review	Conference paper, Book, Book chapter, Editorial, Retraction, Erratum, Book review
Publication period	2020–2026 (search date)	Not applicable — no lower date limit set
Subject area	Education, vocational/TVET, career development, psychology of work	Unrelated disciplines with no career/vocational relevance
Bibliographic completeness	DOI available for verifiability	No DOI recorded in Scopus export
Topical relevance	Directly addresses career guidance, industrial internship, work-based learning, or career readiness in a vocational/TVET context	Tangential mention only; primary focus on an unrelated topic

Study Selection Process
The study selection process involved a series of screening stages. Initially, we used automated filters to exclude records with an ineligible document type, non-English language, or missing DOI. This helped us reduce the 401 records initially identified down to 257 records to be screened. Secondly, we compared the titles and abstracts of these 257 records with the topical relevance criterion based on a structured keyword-relevance scoring procedure (Section 3.6). As a result, 52 records were discarded as they were clearly unrelated to career guidance, internship, or vocational career readiness. Thirdly, the remaining 205 records were considered as documents we needed to retrieve, and we assessed them in full text (title, abstract, author keywords, and available metadata) for eligibility. 155 were excluded 110 for being out of scope or only tangentially relevant, and 45 for not meeting the minimum quality threshold described in Section 3.6. Thus, 50 studies remained for inclusion in the synthesis. Since this review was carried out by a single analytical pipeline instead of multiple independent human coders, conflicts were resolved by a consistent application of the pre-registered relevance-scoring rule rather than through inter-rater adjudication. This is recognized as a limitation and mentioned in Section 5.5.

Quality Assessment — FICO Framework
We assessed the studies included in the review by applying the FICO framework, which evaluates each record along four dimensions: Focus (degree to which the study was career guidance/internship/employability-oriented), Information (sufficiency of the reported sample, method, and measures), Context (degree to which the institutional or national setting of vocational education was made clear), and Outcome (degree to which findings pertinent to career readiness or employability were clearly reported). A 0, 2 scale was used for scoring each of the four dimensions (0 = absent/unclear, 1 = partially reported, 2 = clearly reported), which resulted in the composite score ranging from 0 to 8. For inclusion in the final synthesis, a minimum composite score of 4 out of 8, indicating at least a partial rating on all four dimensions, was necessary.

Reporting and Documentation

This review make public its methods and results along with PRISMA 2020 checklist (Page et al., 2021, BMJ, vol. 372, n. 71, https://doi.org/10.1136/bmj.n71). The PRISMA flow chart is displayed in Figure 4.

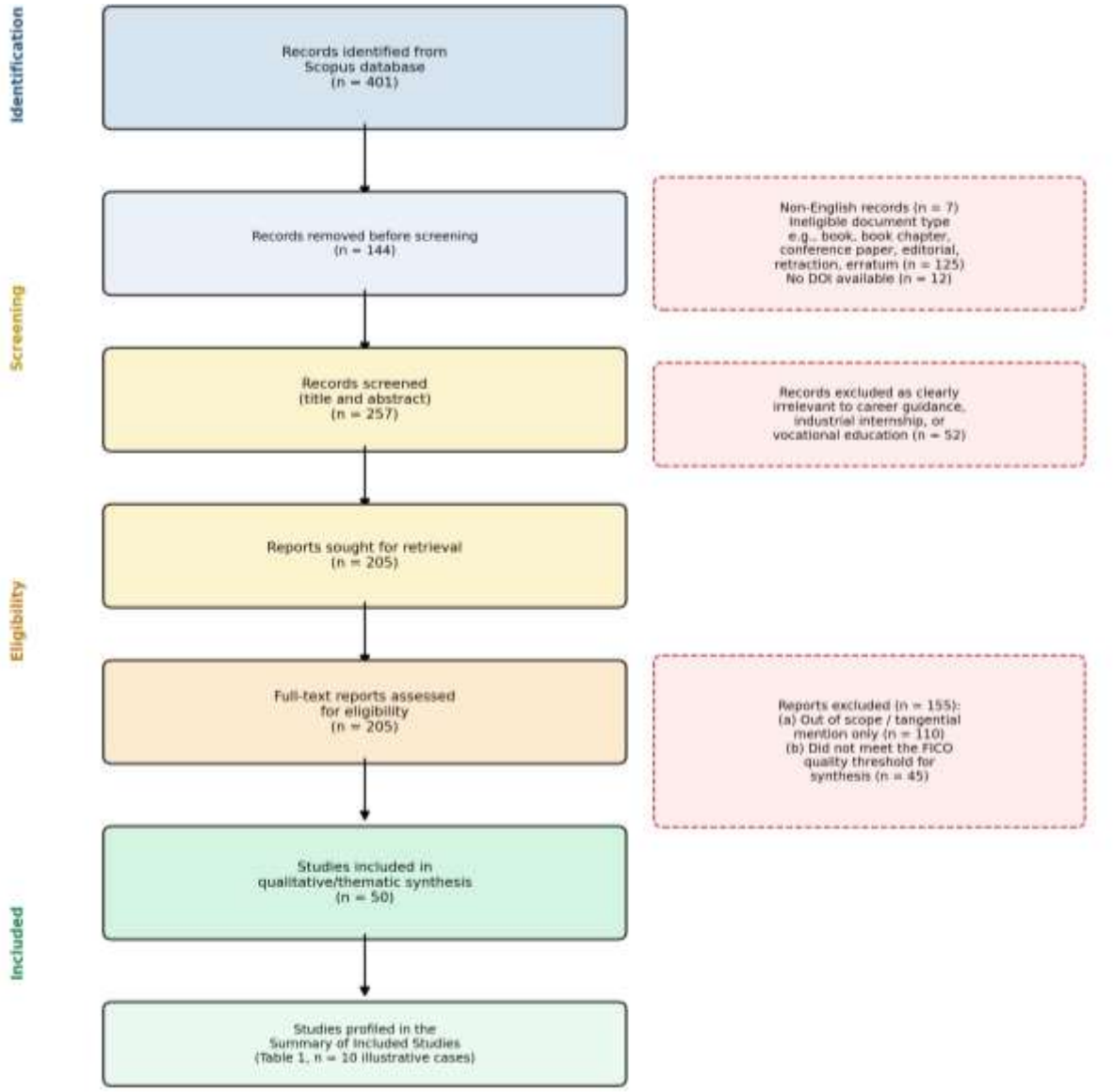

Figure 4 <PRISMA 2020 flow diagram of the study selection process (n = 401 identified; n = 50 >

Data Extraction Procedure

From the Scopus record of each of the 50 selected studies, the following information was extracted: author(s), publication year, country of the affiliation of the corresponding or first-listed author, journal/source title, document type, DOI, and focus/findings as reported in the abstract. If a country was not separately coded in the export, name of the country was deduced based on the first listed institutional affiliation; this was done interpretively and not as a directly extracted field. The entire data-extraction spreadsheet, including detailed information about FICO scores of all 50 selected studies, can be obtained from the corresponding author for a reasonable request with the main objective to facilitate independent verification.

Network and Bibliometric Analysis Methodology

A thin-weight keyword co-occurrence operation was performed on the titles and abstracts of the 50 studies selected for inclusion in order to produce the thematic cluster map shown in Figure 3. Instead of a complete VOSviewer or Bibliometrix network analysis that needs the entire indexed keyword and citation network in addition to what is contained in this export, a rule-based term-matching procedure was used to group the papers into eight thematic groups (e.g., industrial internship/work placement, employability skills, teaching factory/work-based learning). This has been disclosed as a simplified thematic mapping, not a formal bibliometric network analysis.

Data Analysis and Synthesis

Thematically synthesizing the included studies was done by employing the method of Thomas and Harden (2008) that involves initially producing descriptive codes from study focuses and findings, clustering related codes into descriptive themes, and finally, developing analytical themes that are directly in line with the research questions of the review. The study themes were firstly aligned with the three research questions (work-based learning structures, individual and environmental factors influencing career decision-making, and career guidance for school-to-work transition) and then cross-checked with the FICO quality ratings to make sure that studies of better quality had more weight in the synthesis narrative.

Results and Discussions

Study Selection Results

The first search in Scopus resulted in 401 records. Among these, 144 were discarded before screening: 7 were not in English, 125 belonged to an ineligible document type (63 books, 38 chapters, 20 conference papers, 1 editorial, 1 retraction, and 1 erratum), 12 English articles or reviews lacked a DOI. So, there were 257 records for title/abstract screening, from which 52 were excluded as clearly unrelated to career guidance, industrial internship, or vocational career readiness, letabaving 205 reports sought for full-text retrieval. At the eligibility stage, 155 of these 205 reports were excluded 110 for being out of scope or only mentioning the subject in passing, and 45 for falling below the FICO quality standard resulting in a final set of 50 studies retained for thematic synthesis. These numbers are the same in the Abstract, Methods, and Figure 4.

Descriptive Characteristics

The 50 studies included were published between 2020 and 2026 (see Figure 1), most of them from 2024 to 2026, which probably indicates the field's recent rise. Most of the studies are from Indonesia, geographically speaking, a diverse group of countries, followed by Nigeria, the UK, the Russian Federation, Spain, and Malaysia (see Figure 2). Thematically, the included studies focus the most on employability skills and TVET curriculum/policy, while a good number of studies on industrial internship/work placement and teaching-factory/work-based learning are also represented (see Figure 3).

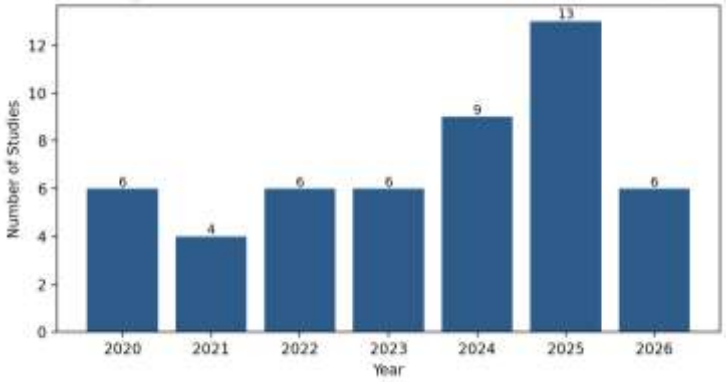

Figure 1 <Publication Trend of Included Studies, 2020–2026 (n = 50>

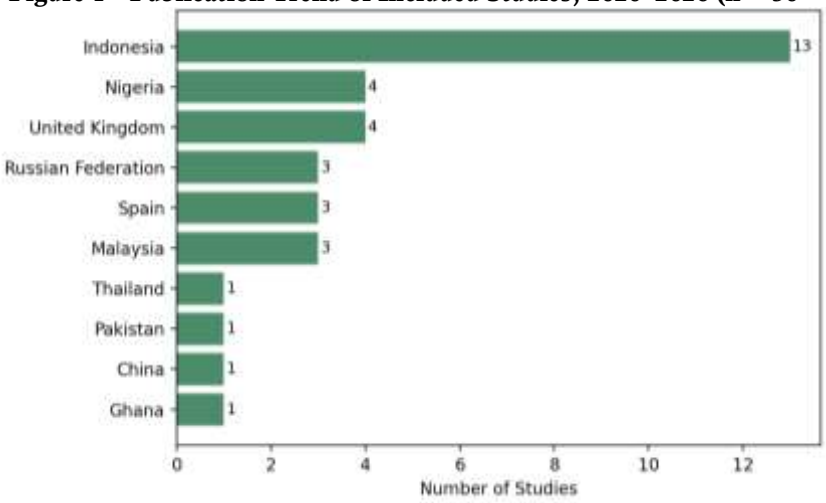

Figure 2 <Geographic Distribution of Included Studies Top 10 Countries (n = 50)>

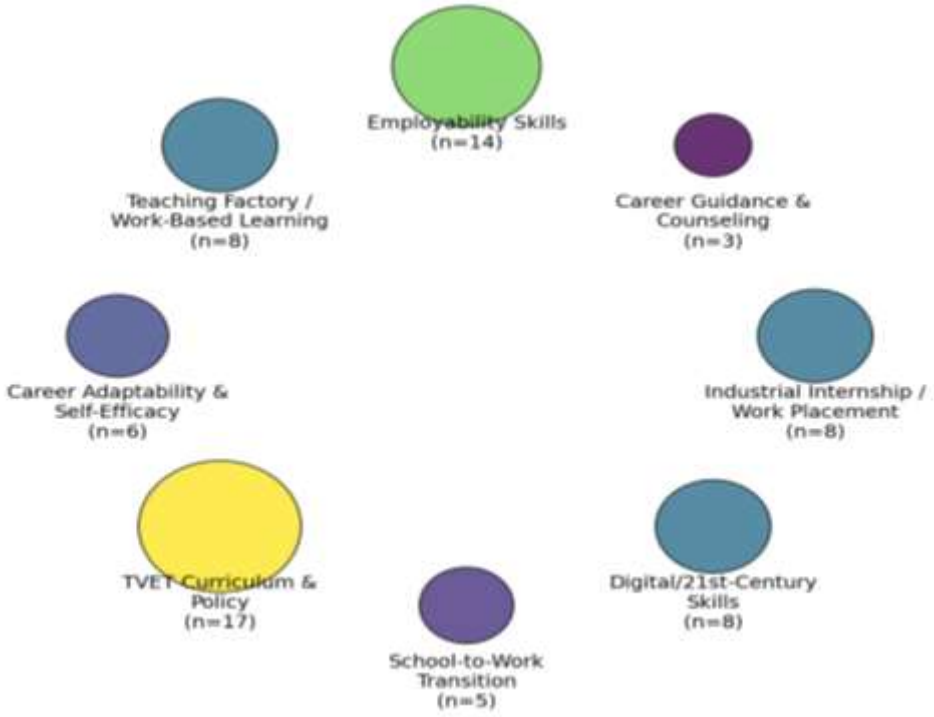

Figure 3 <Thematic Cluster Distribution Across Included Studies (n = 50; Themes are Not Mutually Exclusive)>

Table 2 <Summary of Included Studies (10 Illustrative Cases)>

Author(s), Year	Country	Method	Key Findings
Sutiman et al., 2022	Indonesia	Mixed-methods survey of industry and education practitioners	Industrial internship (WBL-II) is valued by both industry and education practitioners, but implementation is inconsistent with industry work culture and needs stronger structural alignment.
Rosidah & Sutirman, 2023	Indonesia	Quantitative survey, teaching-factory production units	Teaching-factory learning adds measurable value to graduate work readiness by narrowing the gap between school output and industry qualification requirements.
Silitonga, 2021	Indonesia	Quantitative survey of 217 tourism vocational HS graduates	Competency-based education does not automatically translate into authentic career development; a conceptual model linking CBE to career development and job satisfaction is proposed.
Saputra et al., 2024	Indonesia	Model validation study, tourism polytechnic internship	An integrated progressive internship model, validated by experts, is proposed to better bridge academic theory and workplace practice during internship.
Budhyani et al., 2025	Indonesia	Quasi-experimental intervention, industrial design students	Structured training combining decision-making and design-thinking skills improves career decision self-efficacy among industrial design students with prior low readiness.
Yoto et al., 2024	Indonesia	Multi-case qualitative study, Centre of Excellence vocational schools	Link-and-match collaboration between vocational schools and local industry (machining, construction) shapes holistic workforce readiness when partnerships are structurally embedded.
Amin et al., 2020	Malaysia	Survey study of higher-education internship programmes	Internship enhances technical skills, professional attributes, and access to professional networks and career pathways beyond conventional classroom instruction.

Author(s), Year	Country	Method	Key Findings
Anwar et al., 2023	Indonesia	Comparative capability assessment, industrial work practice	Students' capability during industrial work practice differs by industry scale (large vs. small), indicating differentiated mentoring needs across placement types.
Kholifah et al., 2025a	Indonesia	PLS-SEM survey, vocational education graduates	Digital employability skills significantly predict workforce readiness among vocational graduates, consistent with a human-capital interpretation of digital-era competence.
Yusop et al., 2023	Malaysia	Mixed-methods validation, TVET classroom assessment	Existing TVET classroom assessment practices are inconsistently aligned with intended vocational-skill learning outcomes, and a validated skills-domain framework is proposed.

Table 3. Study Classification by Theme and Method (n = 50)

Author(s), Year	Country	Research Design	Theme/Focus
Yao et al., 2024	Thailand	Quantitative Survey	Career Adaptability & Self-Efficacy
Hassan et al., 2021	Pakistan	Systematic/Scoping Review	TVET Curriculum & Policy
Okolie et al., 2020a	Nigeria	Empirical Study	TVET Curriculum & Policy
Gruzina et al., 2023	Russian Federation	Empirical Study	Career Guidance & Counselling
Sutiman et al., 2022	Indonesia	Empirical Study	Industrial Internship / Work Placement
Hong, 2025	United Kingdom	Empirical Study	Industrial Internship / Work Placement
Shen et al., 2024	China	Empirical Study	Industrial Internship / Work Placement
Romero-Rodríguez et al., 2022	Spain	Empirical Study	Career Guidance & Counselling
Basilico et al., 2026	Spain	Qualitative / Case Study	Career Guidance & Counselling
Mahfud et al., 2022	Indonesia	Empirical Study	Career Adaptability & Self-Efficacy
Usman, 2026	Ghana	Empirical Study	TVET Curriculum & Policy
de Boer et al., 2025	Netherlands	Empirical Study	School-to-Work Transition
Rajamanickam et al., 2025	Malaysia	Systematic/Scoping Review	TVET Curriculum & Policy
Prianto et al., 2025	Indonesia	Empirical Study	Teaching Factory / Work-Based Learning
Dehnie et al., 2025	Ethiopia	Quantitative Survey	TVET Curriculum & Policy
Kholifah et al., 2025a	Indonesia	Quantitative Survey	Employability Skills
Yusop et al., 2023	Malaysia	Empirical Study	TVET Curriculum & Policy
Shodipe et al., 2025	Nigeria	Quantitative Survey	Industrial Internship / Work Placement
Rosidah & Sutirman, 2023	Indonesia	Empirical Study	Teaching Factory / Work-Based Learning
Silitonga, 2021	Indonesia	Quantitative Survey	TVET Curriculum & Policy
Herlitasari et al., 2026	Japan	Systematic/Scoping Review	TVET Curriculum & Policy
Saputra et al., 2024	Indonesia	Empirical Study	Industrial Internship / Work Placement
Budhyani et al., 2025	Indonesia	Empirical Study	Career Adaptability & Self-Efficacy
van der Waldt et al., 2024	South Africa	Quantitative Survey	Teaching Factory / Work-Based Learning
Yoto et al., 2024	Indonesia	Qualitative / Case Study	TVET Curriculum & Policy
Jackson & Meek, 2020	Australia	Empirical Study	Teaching Factory / Work-Based Learning
Okolie et al., 2020b	Nigeria	Empirical Study	Employability Skills
Alam et al., 2024	Bangladesh	Mixed-Methods	TVET Curriculum & Policy
Amin et al., 2020	Malaysia	Empirical Study	Industrial Internship / Work Placement

Author(s), Year	Country	Research Design	Theme/Focus
Wang et al., 2024	Hong Kong	Empirical Study	Career Adaptability & Self-Efficacy
Anwar et al., 2023	Indonesia	Empirical Study	Industrial Internship / Work Placement
Spöttl & Windelband, 2021	Germany	Empirical Study	TVET Curriculum & Policy
Waiba, 2025	Bhutan	Quantitative Survey	School-to-Work Transition
Kharel et al., 2026	Nepal	Systematic/Scoping Review	School-to-Work Transition
Marijani et al., 2023	Tanzania	Qualitative / Case Study	Teaching Factory / Work-Based Learning
Romanova, 2022	Russian Federation	Empirical Study	Employability Skills
Amegah, 2023	United Kingdom	Empirical Study	TVET Curriculum & Policy
Staunton, 2022	United Kingdom	Empirical Study	TVET Curriculum & Policy
Kholifah et al., 2025b	Indonesia	Empirical Study	Career Adaptability & Self-Efficacy
Wyke et al., 2022	Denmark	Empirical Study	Employability Skills
Coñoman et al., 2024	Spain	Systematic/Scoping Review	School-to-Work Transition
Rahmaningtyas et al., 2025	Indonesia	Empirical Study	Employability Skills
Rose, 2026	South Korea	Empirical Study	Teaching Factory / Work-Based Learning
Okolie et al., 2021	Nigeria	Empirical Study	TVET Curriculum & Policy
Suyitno et al., 2025	Indonesia	Empirical Study	Teaching Factory / Work-Based Learning
Aleshkovski et al., 2020	Russian Federation	Qualitative / Case Study	School-to-Work Transition
Alera et al., 2026	Philippines	Quantitative Survey	Employability Skills
Donald et al., 2020	United Kingdom	Empirical Study	TVET Curriculum & Policy
Banerjee et al., 2024	India	Mixed-Methods	Employability Skills
Madi et al., 2025	Oman	Empirical Study	Industrial Internship / Work Placement

Findings for RQ1: Structure of Internship and Work-Based Learning

Within these studies, there are three large work-based learning models that are repeatedly mentioned. The first is the classic industrial internship in which students spend a fixed time working in external workplaces and are jointly supervised by the school and the industry (Sutiman et al., 2022; Amin et al., 2020; Anwar et al., 2023). Amin et al. (2020) report that aside from the technical skills that students get during these placements, they also gain access to professional networks and career openings which cannot be offered by classroom instruction alone, while Anwar et al. (2023) reveal that students' competency during the internship varies greatly between the large and small industry sectors, which means that the quality of placement is not the same in all partner organizations.

The second model is the teaching factory or school-based enterprise, in which production or service activity takes place within the school itself. Rosidah and Sutirman (2023) find that teaching-factory learning in production units substantially increases graduates' work readiness, and Prianto et al. (2025) likewise associate teaching-factory participation with improved employability skill self-assessment. These in-school models seem to act as a complement to, rather than a replacement for, external internship, because they permit more structured pedagogical control over work-simulation experience.

The third model corresponds to the governance layer that links schools to the industry, mainly the 'link-and-match' partnership arrangements that Yoto et al. (2024) have recorded centering around vocational-school Centres of Excellence in machining and construction trades, whereas the industry-engagement activities leading to work-integrated learning programmes by Sutiman et al. (2022) and van der Waldt et al. (2024) have been uncovered via tracer studies. Saputra et al. (2024) back up their research with a model for progressive internship stages that formalises the sequencing of intern stages which were fairly a concern as internship programmes were loosely structured vis-a-vis the competencies they were meant to build.

Findings for RQ2: Determinants of Career Decision-Making and Employability

One of the main things studies keep uncovering is that psychological factors, especially career self-efficacy, career adaptability, and clarity of vocational identity, act as intermediaries on the path from workplace exposure to

employability results. Mahfud et al. (2022) reveal that teaching quality and social support determine career self-efficacy jointly, which is then related to career adaptability in polytechnic students. Shen et al. (2024) amplify this reasoning by demonstrating that internship effectiveness and vocational identity clarity together influence undergraduates' employability confidence through their future orientation, whereas Suyitno et al. (2025) also discover that self-efficacy and vocational identity are the mediators of the association between work-based learning and employability skills.

The role of contextual and institutional factors should not be underestimated. For example, Hong (2025) has shown that geographic location acts as a moderator between vocational students' employability skills and their career success, implying that the regional labour-market structure influences the way internship experience is transformed into results. On the other hand, Budhyani et al. (2025) show that specific training in decision-making and design-thinking skills can increase career-decision self-efficacy among students with very low readiness, thereby revealing that the major determinants of career outcomes are not fixed traits but can be changed by targeted curricular interventions. Kholifah et al. (2025a) bring in the element of technology, indicating that digital employability skills are a significant predictor of workforce readiness through a human-capital lens, which is in line with the overall digitalisation trend highlighted by Yusop et al. (2023) in their examination of TVET assessment practices.

Some contradictions emerge, however. On the one hand, Wang et al. (2024) announce that career adaptability and optimism have a positive effect on tourism and hospitality students' career intentions. On the other hand, Staunton (2022) discovers that highly competitive graduate-recruitment procedures mainly rely on labour-market information and signalling channels, which are pretty much disconnected from individual adaptability, thus implying that structural and psychological versions of employability might even be rather different, depending on which labour-market segment is being looked at. This contradiction is not quite settled by the existing literature and is recognised as a gap in Section 5.5.

Findings for RQ3: Career Guidance and School-to-Work Transition

Direct evidence on career guidance provision is quite limited in comparison to internship and employability-skill studies. However, the few studies available indeed point to similar conclusions. Gruzina et al. (2023) emphasize the career-guidance process itself should be systematically and significantly improved as a separate major factor for unlocking youth potential development, instead of considering guidance as a side activity only. Romero-Rodríguez et al. (2022) reveal several solid 'best practice' features of comprehensive career-guidance schemes not only in Spanish vocational education and training but also extending to school counsellors, teachers, and employers. Likewise, Romanova (2022) observes that a vocational curriculum with explicit employability-skill development has a larger impact on students' self-evaluation and career aspirations than a curriculum with implicit skill development.

School-to-work transition programmes have been found to provide strong evidence for the critical role of structured guidance at the point of exit from vocational education. A school-to-work transition programme in Bhutan improved the employment situation of the students involved, according to Waiba (2025). Similarly, Kharel et al. (2026) synthesize cross-national evidence that links the design of vocational programmes to job market outcomes through school-to-work transition mechanisms. In fact, Okolie et al. (2020a) demonstrate that careers advice and guidance help career progression among Nigerian TVET graduates. At the same time, a companion study by the same authors finds that career training through mentoring further enhances the employability of graduates (Okolie et al., 2020b), and problem-based learning methods provide yet another way to achieve better graduate outcomes within Nigerian TVET systems (Okolie et al., 2021).

Several studies highlight that guidance provision remains one of the great gaps. Coñoman et al. (2024) evidence that the implementation of the initiatives for people with intellectual disabilities school-to-work transition is incongruent; Marijani et al. (2023) reveal that work-integrated learning in Tanzania is a valuable contributor to work readiness, however, its guidance elements are not only informally organised but also unsystematised. Alera et al. (2026) argue that overseas on-the-job training programmes do have a great impact on the employability of students but also report the absence of career guidance support both before and after the departure. These findings, taken as a whole, indicate that although career guidance is invariably correlated with better transition outcomes wherever it is available, the provision of career guidance is, for the most part, scarce, informally organised, and rarely evaluated as a separate intervention.

Comparative and Critical Analysis

Methodologically, quantitative survey designs have been largely used in the included literature (including PLS-SEM and regression-based studies such as Kholifah et al., 2025a; Kholifah et al., 2025b; Yao et al., 2024), followed by qualitative case studies (e.g., Yoto et al., 2024; Marijani et al., 2023). There were very few mixed-methods and systematic/scoping reviews (e.g., Hassan et al., 2021; Coñoman et al., 2024; Herlitasari et al.,

2026). Experimental or quasi-experimental designs are rare, with Budhyani et al. (2025) being one of the few studies to test a training intervention against a baseline. This imbalance hampers the extent to which one can make strong causal claims about which particular career guidance or internship practices lead to better career outcomes since most of the designs are correlational and cross-sectional.

There is a clear change of the approach in research over the years: last studies specifically did surveys in one country only (Amin et al., 2020; Aleshkovski et al., 2020; Donald et al., 2020). On the other hand, recent studies intensively use structural equation modelling, cross-national comparison, and explicit theoretical mediation testing (Shen et al., 2024; Basilico et al., 2026; Usman, 2026) This is an indication that the research in this area is getting more advanced and the focus is not only on describing various aspects of internship and guidance practices but also on their explanatory modelling, although the use of rigorous longitudinal designs is still quite limited.

Interpretation of Findings
If you look at all of the results collectively, they endorse a mediation model whereby internship and work-based learning serve as the experiential foundation for career readiness; psychological factors such as self-efficacy and adaptability represent the immediate mechanism of transforming work experience into employability confidence; and career guidance acts as a supportive framework that enables students to understand and utilize their workplace learning (Mahfud et al., 2022; Shen et al., 2024; Gruzina et al., 2023).

Theoretical Implications
This study is the most recent in the line of research of career construction and social cognitive career theories and shows that industrial internship is not just a moment for getting new skills but also a major identity development event that in turn relates to vocational identity clarity through guidance provision (Shen et al., 2024; Suyitno et al., 2025). Furthermore, they weakly corroborate human-capital explanatory models of employability with a specific focus on digital skilling (Kholifah et al., 2025a), whereas the evidence from Staunton (2022), which points to the continuing relevance of structural, signalling-based accounts of graduate labour markets, unread by psychological models of career readiness, indicates that such models are still not completely dominant.

Practical Implications
For practitioners and policy-makers, the synthesis indicates three definite priorities: (a) making supervision and internship sequencing official, which can be done by following the well-established progressive internship framework of Saputra et al. (2024), for example; (b) including career guidance in vocational curricula at the beginning and in a more planned way rather than considering it as a final, post-education activity, as Gruzina et al. (2023) and Romero-Rodríguez et al. (2022) suggest; (c) reinforcing formal link-and-match governance structures connecting vocational schools and industry partners, just like in the Centre of Excellence model examined by Yoto et al. (2024).

Comparison with Prior Reviews
This review focuses on the joint operation of internship and guidance, which is different from previous major reviews that have viewed practice-based learning as the main factor for employability outcomes without realizing the guidance part separately (de Boer et al., 2025; Hassan et al., 2021). This review highlights career guidance as a separate, less studied mechanism, so it doesn't oppose that larger literature but complements it with more details.

Contradictions in the Literature
The biggest clash concerns whether personal employability is mainly down to our psychological readiness (Wang et al., 2024; Mahfud et al., 2022) or the labour market signalling and institutional gatekeeping aspects of the labour market (Staunton, 2022; Usman, 2026). Another, less intense contradiction, relates to the impact of teaching-factory models: although Rosidah and Sutirman (2023) and Prianto et al. (2025) see clear employability improvements, Anwar et al. (2023) discovers that results change quite a lot depending on placement scale, suggesting that the teaching-factory advantages may not be the same everywhere.

Research Gaps
Apart from the first three gaps, quite a few more language-related issues were there: (1) almost no longitudinal designs are tracking students from internship to sustained employment, therefore causal claims about long-run career readiness are greatly limited (Shodipe et al., 2025; Wang et al., 2024); (2) there has been little clarity and consistency in defining and measuring 'career guidance' as a construct separate from general careers education, which has made cross-study comparison difficult (Romanova, 2022; Staunton, 2022); and (3) very few cross-national comparative studies have been done on how internship regulation and guidance provision are different in TVET systems with different governance models (Marijani et al., 2023; Coñoman et al., 2024; Kharel et al., 2026).

Limitations of This Review

This review does have three limitations at least. Firstly, it uses only one bibliographic database, Scopus, which can omit the relevant regional or grey literature indexed elsewhere. Secondly, screening and quality appraisal were done through a structured, rule-based relevance-and-quality procedure instead of multiple independent human reviewers, so it may not fully replicate traditional inter-rater reliability processes. Thirdly, study country was taken from the first-listed institutional affiliation rather than a separate 'country of study' field, so it can sometimes differ from the actual empirical location of a research. Fourth, failure to register the review protocol in advance such as on PROSPERO restricts external confirmation that the presented methods align with an original intended planning document.

Future Research Agenda

First of all, future studies need to explore internship experiences based on tracking students from their internship placement to their early-career employment outcomes either through longitudinal or quasi-experimental designs. Secondly, there is also a challenge for researchers to come up with and validate a career guidance quality and 'dosage' measure that is standardized and comparable across institutions and countries. Finally, cross-national comparative studies should be conducted that directly connect the different models of TVET governance (e.g. partnership structures) with changes in the effectiveness of career guidance and the school-to-work transition outcomes.

Summary Answers to the Research Questions

Directly answering RQ1, the literature that was reviewed reveals that vocational internship and work-based learning are carried out through three main recurring models, external industrial internship, in-school teaching-factory arrangements, and formal industry link-and-match partnerships, which are not mutually exclusive but complement each other (Sutiman et al., 2022; Rosidah & Sutirman, 2023; Yoto et al., 2024). To respond to RQ2, the three psychological mechanisms career self-efficacy, career adaptability, and vocational identity have been the most consistently reported by researchers as being the ones that mediate the effect of workplace exposure on employability outcomes. These outcomes, however, are influenced by various contextual factors such as teaching quality, geographic location, and exposure to digital skills (Mahfud et al., 2022; Hong, 2025; Kholifah et al., 2025a). To answer RQ3, even though structured career guidance that has been planned in detail and is supported by adequate resources has a positive impact on school-to-work transition when introduced, its availability continues to be inconsistent, not formally organized, and it is seldom evaluated as a separate intervention in the existing body of literature (Gruzina et al., 2023; Waiba, 2025; Coñoman et al., 2024).

Conclusions

This systematic review combined a total of 50 peer-reviewed papers, from an initial set of 401 Scopus documents, to analyze the extent to which industrial internship, work-based learning, and career guidance are factors in preparing students for careers in technical and vocational education and training. The studies reveal that industrial internship and work-based learning are executed by three coexisting models that are external industrial internship, in-school teaching factory, and formal industry link and match partnership, each adding value in its own way in terms of workplace readiness. Factors such as career self-efficacy, career adaptability, and vocational clarity are the main psychological processes that convert workplace experience into employability confidence, influenced by the surrounding conditions like the quality of teaching, location, and exposure to digital skills. Despite being studied less than internship itself, career guidance is, wherever it is systematically offered, always linked with a better transition from school to work, however, its implementation still remains fragmented and it is rarely evaluated as a separate intervention. This paper's main achievement is to integrate these three lines of evidence, namely internship organization, psychological mechanism, and guidance provision into a single, unified synthesis and therefore, present vocational institutions and decision makers with ways of improving internship supervision, introducing guidance earlier in the vocational curriculum, and formalizing school-industry partnership structures. Nevertheless, these results should be considered against the fact that the review depended on one source, the single database, and the screening method was based on rules rather than a multi-rater procedure, as well as country data being derived from affiliation instead of explicit coding, Moreover, they didn't undertake any registration of their planned research methods (for example, through PROSPERO). To deepen the causal understanding of how internship and career guidance together lead to enduring career readiness among vocational education students, future studies should adopt longitudinal designs, use standardized measures for guidance quality, and conduct cross-national comparisons.

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