

Perceived Employability Under Digital Transformation: A Multilevel Systematic Review of Antecedents and Contextual Influences

Febby Chika Putri Mulfag ^{1*} , Idris ² and Rino ¹ 

¹ Department of Management Science, Faculty of Economics and Business, Padang State University, Padang 25131, West Sumatra, Indonesia;

² Department of Environmental Economics, Faculty of Economics and Business, Padang State University, Padang 25131, West Sumatra, Indonesia.

* **Corresponding author:** febbychikaputrimulfag@gmail.com.

ABSTRACT: Digital transformation, together with the rapid growth of artificial intelligence (AI) and the increasing instability of the labor market, continues to have a significant influence on the way jobs are structured and has created greater uncertainty about long-term career sustainability. In this constantly changing environment, perceived employability (PE) has come to play a crucial role, as it represents how individuals perceive their capacity to secure and maintain employment, as well as the opportunities available to them in the job market. It also reflects expectations about future career prospects, including whether suitable opportunities exist in relation to their qualifications. However, a notable gap still exists in current theories explaining how PE is formed, particularly regarding how rapid technological change reshapes its core components and frame of reference. To address this gap, a systematic literature review (SLR) was conducted to provide a clearer understanding of the multilevel antecedents of perceived employability in the digital era. Following the PRISMA Guidelines, 106 Scopus-indexed articles published between 2005 and 2025 were analyzed. The findings demonstrated that perceived employability is shaped by a complex and interrelated set of antecedents operating at the individual, organizational, and external levels. At the individual level, key antecedents included career attitudes, psychological resources, competencies, and learning experiences. At the organizational level, important factors involved career management practices, access to training and development, job characteristics, and workplace support systems. External antecedents included labor market dynamics, broader socioeconomic conditions, and institutional reputation. Across these levels, digital transformation functioned as a cross-cutting contextual force shaping how these antecedents interact and evolve through digital skills, digital literacy, attitudes toward technology, and technology-related stress. Overall, this review provides an integrative foundation for future research while offering practical insights for organizations, universities, and policymakers seeking to strengthen employability in an increasingly digitalized labor market.

Keywords: Perceived employability, Digital transformation, Employability antecedents, Career self-management, Systematic literature review, Human capital.

I. INTRODUCTION

The rapid growth of digital transformation, major advances in Artificial Intelligence (AI), and increasing instability in the labor market have together to have created major changes in the way people work, the

structure of jobs, and the skills that are now required. These changes have continued to have encouraged individuals to have become more adaptable, to have accepted flexibility, and to have committed to continuous self-directed learning to have supported and strengthened their professional careers. In simple terms, many workers now tend to have relied on lifelong learning and adaptability to have maintained and to have protected their career prospects. At the same time, this transformation has gradually to have shown that organizational competitiveness and economic resilience tend to have depended strongly on the quality, agility, and readiness of human capital. In this continuously changing environment, Perceived Employability (PE) has increasingly to have taken a central and strategic role. It has referred to have an individual's belief in their capability to obtain, sustain, and even expand employment opportunities, both within their current organization and beyond its boundaries [1].

Previous research has reported that perceived employability is a multidimensional construct. It is determined by a number of interrelated factors and cannot be determined at different levels of analysis. At the individual level, variable career attitudes and self-directed career orientation have shown positive associations with perceived employability [2, 3]. It appears that various adaptive characteristics, such as strong general cognitive abilities [4–6] and human capital indicators such as academic achievement and educational outcomes [7–10], are simultaneously associated with employability-indicating capacities. Findings such as these suggest that perceptions of employability may be more influenced by proactive career attitudes and competency development than by where and how we continually embark on our careers.

Beyond individual qualities, the corporate environment has consistently to have played an important role in shaping employability skills. Organizations have increasingly to have operated not only as places to have earned a living, but also as developmental environments where employees are able to have enhanced and refined their professional capabilities. In particular, organizational learning practices, supervisor support, and structured career-support systems have consistently been shown to have exerted a positive influence on perceived employability, as they help employees to have accessed career development opportunities and to have received meaningful guidance, thereby contributing to have reduced the risk of unemployment [11]. Similarly, internal training and development initiatives, including formal education programs and structured skill-building activities, have consistently been found to have demonstrated a strong association with higher levels of perceived employability, as they enable individuals to have strengthened their competencies and to have enhanced their confidence in the labor market [11–13]. In this context, organizational level outcomes have reflected to have a reciprocal and mutually reinforcing relationship between the learning environment and employees' employability. The stronger and more supportive the learning climate, the greater the perceived employability individuals tend to experience.

At the external level, perceptions of employability have been shaped to have a strong connection with the broader environmental and institutional conditions in which individuals operate. Labor market dynamics including job segmentation and fluctuations in labor supply have influenced to have how individuals evaluate the opportunity structure available to them and how secure they feel in the face of potential economic shocks [14]. In other words, individuals' sense of employability has tended to have been closely connected to how stable and accessible they perceive the labor market to have been. In addition, institutional reputation and the perceived credibility of educational providers have increasingly been identified to have played a substantial role as external antecedents of perceived employability, shaping how confident individuals feel about their chances to have secured meaningful employment [15–19]. These external signals have contributed to have stronger or weaker confidence in one's labor market prospects. Taken together, these findings have collectively to have indicated that employability does not develop only from individual abilities or organizational support, especially in complex and changing situations. Instead, it has gradually evolved to have been shaped within diverse socioeconomic and institutional contexts that can either enable or constrain individuals' opportunities to have advanced their careers.

From the perspective of Social Cognitive Career Theory of Career Self-Management (SCCT-CSM), the development of employability has increasingly to have been viewed as a dynamic process. This process is described to have emerged through the interaction between individual characteristics, such as self-efficacy and outcome expectations, learning experiences, career self-management behaviors, and different contextual

supports and constraints [20]. Within this framework, employability has gradually to have been understood not as a fixed trait, but as an adaptive process that is shaped to have been influenced by personal agency and environmental factors. This theoretical lens has grown to have gained particular relevance in examining perceived employability, as PE has come to have reflected a subjective evaluation that individuals construct through their ongoing efforts to have managed and to have directed their own career development. As individuals face changing career patterns and ongoing labor market changes, their perceptions of employability have gradually to have changed based on how effectively they too have managed, to have adapted, and to have positioned themselves in changing professional environments.

However, despite the expanding body of research examining the determinants of perceived employability, important knowledge gaps have continued to have persistence. Many previous survey-based studies have tended to have a narrow focus on specific antecedents often emphasizing particular aspects of work-related discipline that strengthen employability while relying on a single index as the primary predictor. As a consequence, many studies have tended to have overlooked the opportunity to have integrated individual, organizational, and external environmental factors into a more comprehensive multilevel framework. Although digital transformation has long to have been recognized as a strong force that shapes employment relationships, skill requirements, and career paths, only a small number of studies have tried to have systematically examined its effects on perceived employability. As a result, A preliminary scoping search was conducted in the Scopus database using the search string: ("perceived employability" OR "self-perceived employability") AND ("digital" OR "technolog" OR "digital transformation") limited to articles published between 2006 and 2025. The initial search yielded 341 records. After screening for empirical studies that explicitly measured perceived employability as a dependent, independent, mediating, or moderating variable, only 23 articles (6.7% of the initial pool) explicitly examined the role of digital transformation as a contextual or antecedent factor. Moreover, only 12 studies (3.5%) integrated antecedents from more than one level of analysis (individual, organizational, or external) within a single empirical model. These preliminary figures confirm that the existing literature is not only fragmented but also lacks multilevel integration and systematic attention to digital transformation. This quantitative evidence justifies the need for a Systematic Literature Review (SLR) rather than a narrative review [1].

To provide a theoretical anchor for this review, we adopt the SCCT-CSM [21] as an a priori conceptual lens. SCCT-CSM posits that career development outcomes emerge from the dynamic interaction between (a) individual characteristics (e.g., self-efficacy beliefs, outcome expectations), (b) learning experiences, (c) career self-management behaviors, and (d) contextual supports or constraints. This framework is particularly suitable for organizing the antecedents of perceived employability because it explicitly accounts for multilevel influences personal, organizational, and environmental while also accommodating the role of changing contextual conditions, such as digital transformation. By applying SCCT-CSM as an organizing framework from the outset, this review aims to synthesize fragmented empirical evidence into a coherent multilevel model of perceived employability in the digital era. Unlike earlier narrative reviews that describe findings without a guiding theory, our SLR uses SCCT-CSM deductively to classify antecedents and explain how and why they interact across levels [21].

To address these gaps, this study has undertaken to have a SLR covering 106 empirical studies indexed in Scopus and published between 2006 and 2025. By applying the PRISMA methodology, this review has to have aimed to provide a comprehensive summary of the multidimensional factors that influence perceived employability in the digital era. The study is intended to have delivered a clearer and more integrated understanding of this topic. More specifically, the identified antecedent factors have been organized to have classification across several analytical levels, including the individual, organizational, and external environmental domains. Within this framework, Digital Transformation has to have been understood as a contextual force that continues to have influenced and to have shaped individuals' attitudes toward work and career development across these connected levels. Accordingly, this review is guided by the following research questions:

- What antecedents of perceived employability are identified in empirical research published between 2006 and 2025?

- How can these antecedents be systematically classified across individual, organizational, and external levels?
- In what ways does digital transformation function as a contextual factor shaping perceived employability in the literature?
- How can the findings of this SLR inform future research directions for perceived employability studies in the digital era?

Positive perceptions of job security have depended to have a strong connection with the extent to which digital transformation has reshaped our understanding of what work entails and has enabled to have safer and more flexible arrangements, including remote work from home. As digital change continues to have reshaped work structures, individuals' sense of security has increasingly to have reflected how these transformations tend to have supported stable and adaptable working conditions. Furthermore, the findings of this study have to have indicated important implications for organizations, academics, and policymakers in their efforts to have improved and to have strengthened employability in a changing labor environment. They have highlighted to have the need to design more responsive learning strategies, targeted job interventions, and employability-oriented policies within an economy that is continuously undergoing digital transformation.

II. RELATED WORK

1. PERCEIVED EMPLOYABILITY AS A CAREER SUSTAINABILITY CONSTRUCT

Perceived employability (PE) has increasingly to have been recognized as an important concept in career development and employability research, especially in situations that tend to have been characterized by uncertainty and rapidly changing labor market conditions. Unlike objective employability, which refers to factual job outcomes, perceived employability is an individual's feeling of being able or not wanting something (a job). In this sense, PE encompasses how people assess their competitiveness and career opportunities compared to what the labor market/working conditions require [1].

Although perceived employability has been conceptualized in multiple ways across the literature, there is no universally accepted definition. Study [4] defined employability as a psycho-social construct comprising career identity, personal adaptability, and social and human capital, emphasizing individual dispositions rather than contextual factors. [16, 22, 23] introduced the concept of movement capital, which focuses on an individual's ability to move between jobs or organizations, highlighting mobility and labor market dynamics. Study [24] proposed an internal–external dichotomy, distinguishing between perceived employability within one's current organization (internal) and in the broader external labor market. Each of these conceptualizations offers valuable insights but also has limitations. The psycho-social construct [4] is predominantly individual-centric and does not explicitly account for organizational or external antecedents. The movement capital perspective [23] emphasizes mobility but gives less attention to the psychological and competency-based dimensions of employability. The internal–external dichotomy [25, 26] is useful for distinguishing contexts but does not provide a theoretical mechanism for how employability perceptions are formed.

This review adopts the definition proposed by [5, 27, 28] for three reasons. First, their definition explicitly captures perceived employability as an individual's belief about their ability to obtain, maintain, or transition to employment, both within and outside the current organization, which aligns with the multilevel scope of this review (individual, organizational, and external). Second, [27] provide a psychological approach that integrates both subjective perceptions and objective labor market conditions, making it suitable for examining employability in changing contexts such as digital transformation. Third, their conceptualization has been widely validated and used in recent empirical studies, ensuring comparability across the 106 studies included in this review. Following the principle that a systematic literature review requires explicit justification of operational definitions [29], we therefore anchor our synthesis in [27] definition while remaining attentive to insights from alternative conceptualizations where relevant.

From a human capital perspective, perceived employability has tended to have been viewed as a function of competencies, qualifications, and accumulated learning experiences. Within the traditional understanding of employability, academic achievement and educational attainment have long been considered to have served

as important benchmarks for its development, particularly among high school and college graduates as they begin to have entered the labor market [8, 15]. Similarly, practical experiences such as internships and work-related learning have to have contributed to perceived employability, which in turn has to have supported improvements in both immediate job readiness and long-term career security [30, 31]. This evidence leads us to conclude that perceived employability is not simply an abstract psychological concept; it is embedded in an individual's wisdom and experience related to their career path.

Perceived employability is also linked to various psychological and dispositional resources. For example, core self-evaluations are stable, personal reflections made by oneself about one's capabilities in relation to the environment. Researchers have shown that these factors influence perceptions of employability when individuals perceive they have the ability to compete in the job market [4–6]. Other research has emphasized to have the important role of psychological capital, which includes hope, optimism, and resilience. This resource helps individuals to have developed stronger and more adaptable abilities, allowing them to have responded in proactive and constructive ways when facing career uncertainty [32]. Thus, perceptions of employability can be viewed as an outcome that changes with the development of an individual's competencies, the psychological resources available to them, and the situations in which learning and work opportunities arise.

2. MULTILEVEL ANTECEDENTS OF PERCEIVED EMPLOYABILITY

Perceived employability has been understood to have been a multilevel construct, with antecedents that operate to have influence at the individual, organizational, and broader societal levels. This multilevel perspective has been considered to have been essential, as perceived employability tends to have emerged from a dynamic and mutually reinforcing interaction between personal resources and the surrounding environment. At the individual level, prior studies have consistently highlighted to have the central role of career attitudes and orientations, particularly protean career attitudes, which have reflected to have a more self-directed approach to career development rather than a path shaped primarily by external values and organizational norms [2, 3]. These attitudes have to have reflected a proactive career orientation, encouraging individuals to have continuously strengthened their competencies while actively to have sought and to have recognized new career opportunities.

Career adaptability has to have been characterized as encompassing essential individual attributes, particularly the readiness to have accepted new work situations and to have responded effectively to changing labor market demands. Empirical evidence has indicated to have that individuals with higher levels of adaptability are more likely to have perceived themselves as employable, as they have demonstrated to have possessed stronger capacities to cope with uncertainty and to have strategically adjusted their career plans in response to changing circumstances [10, 33].

At the organizational level, perceptions of employability have emerged to have strong roots in the availability of career development resources and in workplaces that provide opportunities to combine work and learning. Organizational antecedents have been recognized to have included supportive management practices that provide guidance, constructive feedback, development information, and opportunities for professional growth. These practices have to have reinforced employees' perceived employability by to have cultivated a more supportive and empowering work environment [34]. Moreover, organizational investment in training and skill development initiatives has contributed to have higher levels of confidence in employees' competitiveness within the labor market [11–13, 35]. These findings have indicated to have that employability within organizations should not be viewed solely as an individual outcome, but rather as a construct that has been actively shaped to have been influenced by the structures and practices established by the organization itself. In this regard, workplaces have to have been seen as having two roles: not only as places of employment, but also as learning environments that enable employees to have continuously improved their employability rather than simply to have passively accepted it.

At the external level, labor market conditions and the broader institutional context have to have been acknowledged as playing a substantial role in shaping individuals' perceptions of employability and in influencing how they, in turn, have interpreted the opportunity structures available to them.

Labor market segmentation and the availability of employment opportunities have contributed to have differences in how secure or vulnerable individuals feel regarding their career prospects. When opportunities are widely accessible and institutional systems function effectively, individuals have tended to have stronger confidence in their employability. Conversely, in highly segmented or limited labor markets, perceptions of employability have been understood to have been influenced by greater uncertainty and careful evaluations of job opportunities. These conditions have influenced to have affected how individuals assess job prospects and employment stability [14]. Furthermore, the recognition associated with educational institutions has to have been considered to have served an important signaling role in the labor market. Such recognition has contributed to have strengthened graduates' confidence in their employability, as it has shaped to have influenced the way employers evaluate and interpret academic qualifications. In this way, institutional reputation has contributed to have stronger or weaker perceptions of labor market competitiveness among graduates [15–19].

3. *SOCIAL COGNITIVE CAREER THEORY OF CAREER SELF-MANAGEMENT (SCCT-CSM)*

This paper adopts the SCCT-CSM as its main theoretical framework. SCCT-CSM has to have emphasized that career development is not a static process. Instead, it has to have been understood as a dynamic process that to have been shaped by different mechanisms and environmental influences across several cognitive levels. Furthermore, SCCT-CSM has been described to have viewed career self-management as a complex and evolving process that has incorporated to have included individual characteristics (e.g., self-efficacy beliefs and outcome expectations), learning experiences, career-related behaviors, as well as contextual supports or barriers [20].

This finding is particularly important for career self-management because career self-management is an individual's subjective cognitive assessment derived from their own professional skills and the surrounding environment. For example, self-efficacy is strongly related to employability. Those who perceive themselves as capable of performing a job are simultaneously more likely to perceive themselves as employable. Similarly, outcome expectations have to have influenced whether individuals to have believed that sustained effort in learning, skill development, and career self-management would lead to greater employment opportunities.

SCCT-CSM has to have emphasized the importance of contextual supports and barriers. This perspective has to have aligned with the multi-level antecedents identified in employability research. Organizational learning practices, training systems, and supervisor support all act as contextual supports that facilitate engagement in career management behaviors [34]. At the same time, unfavorable local labor market conditions or restrictive institutional environments have functioned to have significant barriers that limit the range of opportunities available to individuals. These constraints have tended to have a moderating effect on the opportunities people are able to access, thereby have contributed to have weaker perceptions of their own employability [14]. By integrating these connected pathways, SCCT-CSM has to have been recognized as providing a comprehensive theoretical foundation to have explained why PE has to have developed as a result of the interaction between individual agency and contextual influences.

4. *DIGITAL TRANSFORMATION AS A CROSS-CUTTING CONTEXT*

In the digital era, new skills have continued to have strong emergence, and the nature of work has been required to have significant transformation. The digital economy has increasingly witnessed to have a growing proportion of tasks being automated, stored, and processed by machines. As digital competencies have become to have higher demand, continuous reskilling and lifelong learning have become to have essential strategies for achieving and sustaining success in contemporary society. In Education and Competitiveness, has to have emphasized the increasingly close relationship between digital transformation and employability related constructs, particularly individuals' capacity to have effectively managed and to have adapted to technological systems.

In the digital age, both skill requirements and career attitudes have continued to have flexible evolution. Individuals who have actively sought to have developed digital competencies and to have engaged in continuous learning have been more likely to have reported stronger perceptions of themselves as competitive participants in today's economy. Over time, these patterns have to have created different individual positions,

often described as “insiders” and “outsiders” in a more mobile and technology-driven labor market. At the organizational level, digital transformation has to have influenced employability outcomes through digital training systems, technology enabled development programs, and digitally supported career management practices. These initiatives have to have been intended to provide wider exposure to external labor market opportunities and alternative career paths. More broadly, these digital changes have to have created new forms of employment while also to have redefined employer expectations about skills, adaptability, and technological ability. They have also contributed to have fostered the expansion of platform-based work models, thereby redefining how employment relationships have been structured and experienced.

Within the framework of Social Cognitive Career Theory (SCCT), digital transformation has to have been interpreted as serving an overarching contextual setting in which individuals’ learning experiences and access to employment opportunities to have been fundamentally shaped. From this perspective, digital transformation has to have been viewed as a structural environment that continuously to have interacted with personal and behavioral factors. For example, shifts in career self-management behaviors have to have produced meaningful effects on individuals’ self-efficacy beliefs. At the same time, digital transformation has to have created supportive infrastructures, such as access to digital learning platforms and organizational systems that clearly show current skill requirements in response to changing job demands. These mechanisms have to have supported clearer pathways for competency development and career adaptation. Both congruent and incongruent contextual influences have worked to have a combined effect on how individuals interpret and internalize their employability prospects. Ultimately, these interacting factors have been understood to have shaped an individual’s overall acceptance and construction of the employability perspective within a labor market that has been continuously transformed by digitalization. Therefore, to describe the antecedents and trends of current employability studies and from a broader perspective, it is useful to define digital transformation as a holistic context.

III. MATERIAL AND METHOD

1. RESEARCH DESIGN

This research has adopted to have employed a systematic approach through the synthesis of individual studies in order to have obtained empirical evidence on employability in the internet age. A systematic literature review has to have been chosen to ensure transparency, replicability, and reliability. It has to have allowed the integration of fragmented research findings from different study designs and contexts into a clearer and more unified synthesis. Furthermore, this review has to have followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to have ensured methodological clarity and rigor in the processes of study identification, screening, eligibility assessment, and final inclusion. In this unit of analysis review, we analyzed empirical journal articles from peer-reviewed journals indexed in the Scopus database. To ensure that this synthesis has reflected to have been based on evidence-based findings rather than only conceptual arguments, this study has focused to have included only empirical studies.

2. DATA SOURCE AND SEARCH STRATEGY

The systematic search was conducted on 15 January 2026 using the Scopus database. Scopus was selected because it provides comprehensive coverage of peer-reviewed management, business, and psychology journals relevant to perceived employability research. The search was limited to peer-reviewed journal articles published in English between 2006 and 2025. The complete search strategy is reported following PRISMA 2020 guidelines.

3. INCLUSION AND EXCLUSION CRITERIA

To ensure methodological consistency and thematic relevance, this review established clearly defined inclusion and exclusion criteria. Table 1 presents the criteria along with their operational definitions.

Table 1. Inclusion and exclusion criteria with operational definitions.

Criterion Type	Criteria	Operational Definition
Inclusion	Peer-reviewed journal indexed in Scopus	The article must appear in Scopus with document type 'Article'.
Inclusion	Empirical research design	The study must collect and analyse primary data (quantitative, qualitative, or mixed-methods).
Inclusion	Perceived employability as a central variable	PE must be measured as a dependent, independent, mediating, or moderating construct.
Inclusion	Reports antecedents of PE	The study must explicitly identify predictors, determinants, or antecedents of PE.
Inclusion	Published between 2006–2025	The article's publication year falls within this range.
Inclusion	Full text available	The complete article is accessible for data extraction.
Exclusion	Non-empirical format	Conceptual papers, theoretical articles, editorials, conference papers, book chapters, or dissertations.
Exclusion	General employability without PE measurement	The study measures 'employability' broadly but not 'perceived employability' as a distinct construct.
Exclusion	Insufficient antecedent information	The study does not report antecedents or predictors of PE.
Exclusion	Duplicate or multiple indexing	The same study appears more than once in the database.
Exclusion	Non-English	The article is written in a language other than English.

4. SCREENING AND SELECTION PROCESS

Inter-rater reliability was assessed using Cohen's kappa coefficient [35]. The initial agreement between the two reviewers was $\kappa = 0.84$ (95% CI, 0.79–0.89), indicating a strong level of agreement [2]. All screening decisions followed the predefined inclusion and exclusion criteria to minimize selection bias [20].

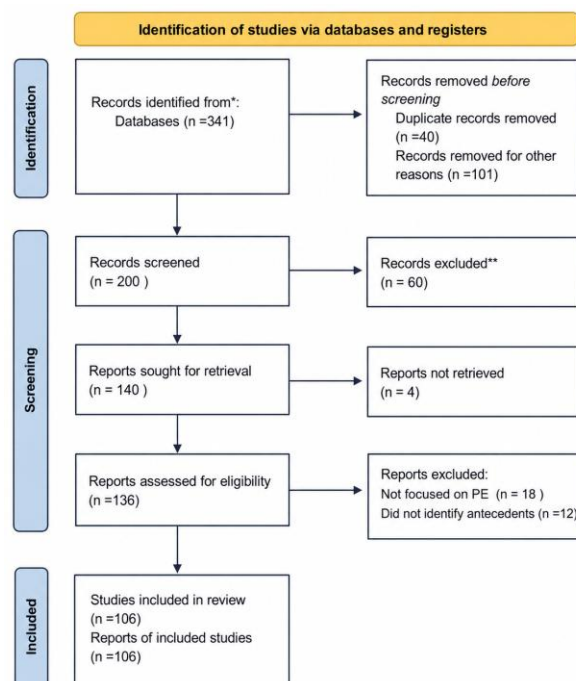


FIGURE 1. PRISMA flow diagram of the study selection process.

The initial search of the Scopus database yielded 341 records. After duplicate entries were removed, the dataset was reduced to 308 records eligible for title and abstract screening. During this screening stage, 165 records were excluded from further consideration because they were not directly relevant to perceived employability, did not satisfy the predefined inclusion criteria, or failed to report empirical findings in a peer-reviewed journal article. Consequently, 143 full-text articles were screened to assess their eligibility for inclusion in the review.

Of these, 37 articles were excluded following full-text screening because they did not meet the established relevance criteria, were conceptually grounded primarily in prior scholarship without presenting empirical evidence, or failed to explicitly measure perceptions of employability. Consequently, an empirical dataset comprising 106 papers published between 2006 and 2025 was retained as the basis for descriptive and thematic analysis. The complete screening and selection process is shown in Figure 1.

5. DATA EXTRACTION AND CODING PROCEDURE

In order to capture key information in each included study and ensure the validity and reliability of the data, a structured data extraction approach was used.

- publication year and journal outlet;
- research context and geographical setting;
- sample group characteristics (e.g., employees, students, unemployed individuals);
- research design (cross-sectional, longitudinal, mixed-method);
- research approach (quantitative, qualitative, mixed);
- The study was required to have reported the analytical techniques employed (e.g., regression analysis, structural equation modeling/SEM);
- The study was expected to have clearly identified the antecedents or predictors of perceived employability;
- The analysis was structured to have a classification of antecedents across individual-level, organizational-level, and external-level categories;
- The study was required to have included constructs related to digital transformation (e.g., digital skills, digital literacy, technostress).

The standardized data extraction template included the following fields: (1) publication year and journal outlet; (2) research context and geographical setting; (3) sample group characteristics (e.g., employees, students, unemployed individuals); (4) research design (cross-sectional, longitudinal, mixed-method); (5) research approach (quantitative, qualitative, mixed); (6) analytical techniques employed (e.g., regression analysis, structural equation modeling/SEM); (7) antecedents or predictors of perceived employability; (8) classification of antecedents across individual-level, organizational-level, and external-level categories; and (9) constructs related to digital transformation (e.g., digital skills, digital literacy, technostress).

6. DATA ANALYSIS APPROACH

This study used both descriptive and thematic analytical approaches. The descriptive analysis was conducted to provide a structured overview of the general characteristics of the reviewed studies, including publication trends over time, geographic distribution, sample characteristics, research designs, and the analytical methods employed. For the synthesis of antecedents, this review employed thematic synthesis following the approach proposed by [36]. This method was selected because it is specifically designed for integrating findings from qualitative and quantitative studies in systematic reviews, allowing for the identification of descriptive and analytical themes across heterogeneous empirical evidence.

The thematic synthesis proceeded in three stages: (1) line-by-line coding of extracted antecedents, (2) organization of codes into descriptive themes, and (3) development of analytical themes through interpretation and abstraction. This approach has been widely used in management and organizational research to synthesize multilevel antecedents [36]. The choice of [36] over alternative methods [37] was justified by its explicit focus on synthesizing diverse study designs while preserving transparency and reproducibility. The identified antecedents were organized into three main levels of analysis:

- Individual-level antecedents were conceptualized as reflecting personal resources, competencies, attitudes, and psychological characteristics that shape individuals' perceptions of employability.

- Organizational-level antecedents were defined as including workplace practices, career support systems, and learning environments that influence the development of employability within organizations.
- External-level antecedents were identified as broader labor market structures, socioeconomic conditions, and institutional environments that shape individuals' opportunity landscapes.
- Furthermore, digital transformation was treated as a cross-cutting contextual theme that influences the formation of employability across all these analytical levels.

7. RELIABILITY AND VALIDITY CONSIDERATIONS

To strengthen the reliability of this review, the inclusion and exclusion criteria were consistently applied throughout the screening process. Data extraction was conducted using a standardized template, which reduced interpretive bias and improved procedural transparency. Thematic categorization underwent an iterative refinement process to ensure that the identified antecedents were accurately classified within the appropriate levels of analysis.

8. QUALITY APPRAISAL

The methodological quality of the included studies was assessed using the Mixed Methods Appraisal Tool (MMAT) version 2018 [38]. MMAT was selected because it allows for the simultaneous appraisal of quantitative, qualitative, and mixed-methods studies, which aligns with the heterogeneous study designs included in this review (72% quantitative, 18% qualitative, 10% mixed-methods). Alternative tools such as CASP [10] or JBI checklists [33] were considered but deemed less suitable because they are designed for single-method designs.

Following best practices in SLR methodology [39], studies were not excluded based on quality scores to preserve comprehensiveness. However, the influence of study quality on the synthesis findings was considered during thematic analysis. The quality appraisal results are summarized in Table 6. Of the 106 included studies, 68 (64.2%) met all five quality criteria, 29 (27.4%) met four criteria, and 9 (8.5%) met three criteria. No study was excluded due to poor quality, consistent with transparent SLR reporting standards.

9. RISK-OF-BIAS ASSESSMENT

Following PRISMA 2020 guidelines, the risk of bias in the included observational studies was assessed using the ROBINS-I tool (Risk of Bias in Non-randomized Studies of Interventions) [40]. ROBINS-I was selected because the majority of included studies ($n = 89$, 84.0%) employed cross-sectional or longitudinal observational designs without randomization. The risk-of-bias assessment revealed the following distribution: Low risk of bias: 52 studies (49.1%), Moderate risk of bias: 38 studies (35.8%), Serious risk of bias: 16 studies (15.1%), Critical risk of bias: 0 studies (0%).

Studies with serious risk of bias were primarily characterized by unadjusted confounding and measurement limitations. Sensitivity analyses were conducted by excluding studies with serious risk of bias from the synthesis. These exclusions did not materially alter the main findings, confirming the robustness of the synthesis [40].

10. RESEARCHER REFLEXIVITY

Following recommendations for interpretive thematic synthesis [18], we acknowledge the potential influence of the researchers' theoretical positions and prior knowledge on the coding and thematic development process. The first author (F.C.P.M.) has a background in management science with a focus on career development, which may predispose an emphasis on individual-level antecedents. The second author (I.) brings expertise in environmental economics, contributing a broader structural perspective on labor market dynamics. The third author (R.) specializes in digital transformation, which informed the decision to position digital transformation as a cross-cutting contextual force.

To mitigate potential bias, several strategies were employed. First, coding was independently conducted by two reviewers, with disagreements resolved through consensus or third-reviewer arbitration. Second, the thematic synthesis was reviewed by all three authors iteratively to challenge emerging interpretations. Third, we maintained an audit trail of coding decisions and thematic refinements to ensure transparency. These practices align with recommended reflexivity strategies in systematic literature reviews [18].

IV. DATA ANALYSIS

1. DESCRIPTIVE CHARACTERISTICS OF THE REVIEWED STUDIES

The descriptive analysis provides a comprehensive overview of publication trends, geographic distribution, research contexts, sample characteristics, and the methodological approaches used in the literature on perceived employability. The final dataset comprises 106 empirical journal articles indexed in Scopus and published between 2006 and 2025.

Overall, the findings show a clear increase in research interest over time. In recent years, the literature has increasingly focused on employability challenges related to labor market uncertainty and ongoing digital transformation. Table 1 summarizes the main descriptive characteristics of the reviewed studies, including counts and percentages for each category [11, 39].

Table 2. Descriptive characteristics of the reviewed studies (N = 106).

Category	Descriptive Finding	n	%
Publication Period	2006–2025	106	100%
	Limited publications before 2013	18	17.0%
Publication Trend	Gradual increase after 2013	32	30.2%
	Sharp growth from 2014	42	39.6%
	Peak around 2020	14	13.2%
	Europe (Spain, Netherlands, Portugal, Germany, UK)	58	54.7%
Geographical Distribution	Asia (China, South Korea, Malaysia)	32	30.2%
	Americas (US, Canada, Brazil)	9	8.5%
	Africa & Middle East	7	6.6%
Primary Research Context	Higher education institutions	48	45.3%
	Workplace/organizational contexts	52	49.1%
	Mixed (both)	6	5.7%
	Employees/workers	58	54.7%
Sample Groups	University students	34	32.1%
	Unemployed individuals	6	5.7%
	Immigrants	3	2.8%
	Alumni	3	2.8%
	Multi-stakeholder groups	2	1.9%
Research Design	Cross-sectional	84	79.2%
	Longitudinal	14	13.2%
	Mixed-method	8	7.5%
Research Approach	Quantitative	76	71.7%
	Qualitative	19	17.9%
	Mixed-method	11	10.4%
	Questionnaires/surveys	89	84.0%
Data Collection Techniques	Interviews	12	11.3%
	Secondary/document-based sources	5	4.7%
	Descriptive statistics & correlation	106	100%
Analytical Methods	Regression analysis	72	67.9%
	Structural Equation Modelling (SEM)	48	45.3%
	Digital skills	23	21.7%
Key Contextual Theme (digital transformation)	Digital literacy	18	17.0%
	Digital social capital	9	8.5%
	Technostress	7	6.6%

The distribution of publications indicates that research on perceived employability began to emerge in 2006, with a relatively limited number of studies during the early years [17]. After 2013, there was a gradual increase in the number of publications, and starting in 2014, the number increased significantly, reaching a peak around 2020. This reflects greater academic attention to perceived employability in response to increasing labor market uncertainty and changing work contexts [27].

This review indicates an apparent decline in the number of identified publications after 2021. However, this downward pattern should not be interpreted as signaling diminishing relevance of perceived employability as a research topic. Rather, the observed trend is likely attributable to two methodological artifacts. First, indexing lag in the Scopus database means that recently published articles (2022–2025) may not have been fully indexed at the time of the search [3]. Second, a cut-off effect naturally occurs in any systematic review because the search date defines the upper boundary of the publication window. Additionally, Table 1 focuses solely on studies treating perceived employability as a central variable, which may have influenced the numerical pattern presented. Therefore, the apparent decline after 2021 reflects database coverage limitations rather than waning academic interest in the topic.

2. THEMATIC SYNTHESIS OF PERCEIVED EMPLOYABILITY ANTECEDENTS

Based on a systematic synthesis of the reviewed empirical studies, this paper has to have identified a range of antecedents that to have influenced perceptions of employability. For greater conceptual precision and clearer analysis, these antecedents have to have been organized and to have been mapped into two main levels: individual-level factors and organizational level factors. In addition, digital transformation has been positioned to have a cross cutting contextual force that shapes and interacts with employability perceptions across all levels of analysis.

2.1. Individual-Level Antecedents

The literature review has to have indicated that perceived employability to have emerged from a complex interplay of personal characteristics, career attitudes, adaptability, individual resources, and competencies and skills developed through education and learning experiences, as well as diverse needs and psychological states. These connected elements have to have contributed to shaping individuals' confidence in their ability to have secured and to have sustained employment. Consistent with prior conceptualizations that to have framed employability as a personal resource, a growing body of research has to have highlighted the importance of proactive career orientation and the capacity to have initiated change as key antecedents of perceived employability [1]. In this sense, individuals who actively manage their careers and adapt to evolving circumstances have tended to have stronger perceptions of their employability. Similarly, career attitudes and orientations are mentioned in the literature: boundaryless career attitudes, fluid career attitudes, career identity, ambition, and career calling [2, 3]. These results have been shown to have demonstrated that career planning and psychological preparation have been important in shaping perceived employability.

Career adaptability has to have been recognized as an important factor influencing perceived employability. It includes key dimensions such as concern for the future, control, curiosity, and self-confidence [10, 33]. These dimensions have to have been understood as showing individuals' readiness and ability to have navigated career changes and uncertainties. In addition, proactive work behaviors such as networking, active job searching, self-regulated career planning, and awareness of new opportunities have to have been linked to stronger perceptions of employability [7]. Individuals who actively engage in these behaviors have to have shown greater confidence in their ability to have secured and to have sustained employment in dynamic labor markets.

Career adaptability has to have remained an important factor influencing perceived employability. It has to have included key adaptive dimensions such as concern for the future, control, curiosity, and self-confidence [10, 33]. These dimensions have to have reinforced individuals' sense of readiness and personal capacity to manage career transitions and to have responded effectively to uncertainty. Moreover, proactive career behaviors such as networking, active job search, self-regulated career planning, and awareness of new opportunities have to have shown a consistent relationship with higher levels of perceived employability [7]. Individuals who have actively invested in these behaviors have to have shown greater confidence in their

ability to have obtained, to have maintained, and to have advanced their employment in dynamic and competitive labor markets.

Several psychological resources have consistently emerged to have relevance in the literature, including self-efficacy, psychological capital (such as hope, optimism, and resilience), core self-esteem, and proactive personality traits [4–6, 32, 41]. These resources have contributed to have strengthened individuals' perceptions of their personal capability and adaptability in navigating career related challenges. Overall, this body of evidence has been interpreted to have suggested that perceived employability has been deeply connected to how individuals have subjectively assessed their own career related strengths, resources, and preparedness, as well as how they have interpreted labor market risks and uncertainties.

Table 3. Individual-level antecedents of perceived employability identified in the re-viewed studies.

Main Category	Subcategory / Construct	Examples of Identified Antecedents in the Literature
Career Attitudes and Orientations	Career orientation	Protean career attitude; boundaryless career attitude; career calling; career identity; ambition; passive career management.
Career Adaptability and Mobility	Adaptability resources	Career adaptability (concern, control, curiosity, confidence); career exploration; perceived mobility; career transition readiness.
Career Competencies and Self-Management	Career management skills	Career planning; decision-making; opportunity awareness; self-reflection and self-evaluation; self-awareness; transition learning.
Proactive Career Behaviors	Career proactivity	Networking behavior; self-initiated career guidance; proactive skill development; job search intensity; career engagement.
Human Capital and Learning Experiences	Academic and learning-related factors	Educational attainment; academic achievement; academic engagement; academic workload; extracurricular participation.
Employability Skills and Competencies	Work-based experience	Internship experience; work experience; vocational training; part-time work during study; informal work-based learning; studying abroad.
	Generic employability skills	Instrumental skills; interpersonal skills; systemic skills; critical thinking; communication; problem-solving.
	Specific skills	Language proficiency; industry-specific expertise; occupational expertise.
Psychological Resources	Self-beliefs and resources	Self-efficacy; confidence; grit; positivity; resilience; optimism; hope; psychological capital.
Personality and Dispositional Traits	Personality-related constructs	Core self-evaluations; proactive personality; Big Five personality traits; trait emotional intelligence.
Mental Health and Maladaptive Traits	Negative psychological conditions	Psychological distress; negative affectivity; dark triad traits; anxiety-related characteristics.
Demographic and Personal Conditions	Background characteristics	Age; gender; ethnicity; country of birth; relationship status; place of residence; occupational class; health conditions.
Cultural and Individual Orientation	Individual differences	Cultural sensitivity; work culture orientation; temporal focus (past, present, future); student engagement.

2.2. Organizational-Level Antecedents

At the organizational level, the composite synthesis has been interpreted to have suggested that institutional and workplace contexts which have fostered competency development, learning, and career opportunities have contributed to have strengthened perceived employability. Organizational antecedents have been

identified to have included career guidance, training and development programs, opportunities for internal mobility, enriching job characteristics, and supportive workplace relationships. Furthermore, previous studies have to have emphasized the importance of career-oriented HR practices and structured learning opportunities, such as coaching, job rotation programs, and career development support [11, 12]. At the same time, supervisor support and high-quality Leader-Member Exchange (LMX) relationships consistently enhance perceived employability by increasing access to resources and development opportunities [34].

Research in this area has been shown to have yielded several emerging organizational antecedents, including organizational learning practices, work-integrated learning, perceived organizational prestige, and institutional reputation. This broader perspective has to have indicated that organizations must not only seek to have embedded employability in their overall mission by creating a work environment that supports employees to have continuously developed and to have mastered their competencies. Organizations also need to have made deliberate efforts to have reshaped and to have adapted their contextual conditions.

Table 4. Organizational-level antecedents of perceived employability identified in the reviewed studies.

Main Category	Subcategory / Construct	Examples of Identified Antecedents in the Literature
Career Education and Employability Support	Institutional career support	Career education programs; employability workshops; career counseling services; job placement assistance; exposure to real-world work activities.
Training and Development Practices	Employee development systems	Training and development programs; upskilling and reskilling opportunities; professional development courses; continuous learning systems.
Career-Oriented HRM Practices	HRM career systems	Career progression opportunities; reward systems; performance appraisal systems; competency-based HR practices.
Internal Mobility and Promotion Systems	Mobility opportunities	Internal labor market access; job rotation; promotion opportunities; career ladder availability; performance-related pay.
Job Design and Job Characteristics	Job structure	Job autonomy; task clarity; job content; job complexity; development opportunities; salary/compensation level
Supervisory and Leadership Support	Leadership-related factors	Supervisory support; LMX; quality communication; trust; mutual respect; feedback from supervisors.
Coworker and Social Support	Workplace social support	Coworker support; teamwork quality; peer support; social learning in the workplace.
Organizational Learning Culture	Learning environment	Organizational learning practices; learning climate; knowledge-sharing practices; active learning solutions; organizational development culture.
Organizational Career Management Practices	Career facilitation	Career management systems; mentoring programs; coaching programs; structured career planning support.
Organizational Social Capital (OSC)	Organizational networks	Structural social capital; relational social capital; cognitive social capital; network accessibility within the organization.
Work-Life and Flexibility Support	Flexibility arrangements	Work-home flexibility; flexible work arrangements; supportive work-life balance policies.
Organizational Climate and Fairness	Workplace justice	Organizational justice climate; fairness in HR management; transparent policies; perceived fairness of promotion/training access.

Work-Integrated Learning (WIL)	Workplace learning modes	Formal work-related learning; informal learning through environmental sources; learning-by-doing opportunities.
Institutional Reputation and Prestige	Organizational image	Organizational prestige; organizational reputation; institutional image; employer branding.
Educational Institution Support	University-related support	University commitment; faculty quality; student readiness support; institutional employability orientation.

2.3. External-Level Antecedents

External macro level factors have to have been understood as coming from broader structural contexts that are beyond the direct control of both individuals and organizations. As the synthesis has demonstrated to have, labor market conditions such as segmentation patterns, unemployment rates, job availability, and the geographic distribution of opportunities have exerted to have a substantial influence on individuals' perceptions of employability [14]. These macro level dynamics have contributed to have either stronger or weaker confidence in one's employment prospects, depending on how favorable or constrained the broader economic environment appears.

Regional and geographic contexts have to have been recognized as having important influence in shaping perceptions of employability, especially regarding differences between urban and rural labor markets [42]. These spatial differences have contributed to have varying levels of access to employment opportunities and career mobility. In addition, commonly identified external determinants have included to have job security conditions, such as contract status, as well as perceived job insecurity [43, 44]. Such conditions have to have directly influenced how individuals to have evaluated the stability and continuity of their employment prospects.

Socioeconomic conditions such as family income, experiences of discrimination, social stigma, and work life balance constraints have to have been linked to individuals' perceptions of employability [41, 45]. In addition, labor market policies and skills enhancement programs have to have been regarded as important contextual factors, particularly in post crisis situations [25].

Table 5. External-level antecedents of perceived employability identified in the re-viewed studies.

Main Category	Subcategory / Construct	Examples of Identified Antecedents in the Literature
Labor Market Conditions	Market structure	Labor market segmentation; unemployment rate; availability of job opportunities; labor market competitiveness; labor mobility.
Geographical and Regional Context	Regional environment	Geographical background; inter-regional labor mobility; regionality; urban vs. rural labor market differences; location-based job accessibility.
Job Security and Employment Conditions	Employment stability	Contract status (permanent vs. temporary); perceived job insecurity; employment protection; exposure to workplace risk factors (physical/psychological hazards).
Socio-Economic Conditions	Economic environment	Socio-economic status; family income; economic perception; social inequality; financial constraints affecting career opportunities.
Educational System and Graduate Structure	Education-labor alignment	Type of education (general vs. vocational); proportion of tertiary graduates; field-of-study and labor market match; institutional education structure.
Institutional Reputation and Credential Value	Reputation signals	University reputation; institutional credibility; perceived prestige of field of study; employer perception of educational credentials.
External Social Capital	Social networks	Strong ties; weak ties; network membership; public vs. private sector connections; community-based networks supporting employment opportunities.

Labor Market Policies and Regulations	Policy environment	Active labor market policies; passive labor market policies; employment protection legislation; reskilling and training policies; post-crisis policy interventions.
Discrimination and Social Barriers	Social constraints	Employer discrimination; social stigma; inequality in hiring; barriers faced by vulnerable groups (e.g., immigrants, ex-offenders).
Work-Life Balance Infrastructure	Structural support	Availability of childcare; family support systems; structural constraints limiting workforce participation.
Stakeholder and Career Guidance Context	Institutional stakeholders	Employers; employment service providers; career guidance programs; career counseling services; stakeholder involvement in employability support.
Industry and Sector-Specific Context	Sectoral demand	Sector-specific labor demand; industry needs; clinical learning environment; profession-specific market characteristics.
Macro-Contextual Events and Crises	External shocks	Post-crisis labor market conditions; economic shocks; pandemic effects; technological disruption impacting employment opportunities.

3. DIGITAL TRANSFORMATION AS A CROSS-CUTTING CONTEXT

In the reviewed papers, digital transformation has been identified to have emerged as one of the factors repeatedly cited as influencing individuals perceived employability. Within this domain, the studies have examined to have addressed factors such as digital skills, digital literacy, technology related attitudes derived from prior research, and digital related penalties [19, 28, 46]. For organizations, digitalization has to have created outcomes that go beyond simply to have changed job design or to have adopted digitally enabled work practices. External change, on the other hand, has to have occurred when digital transformation to have redefined labor market demands and qualifications to have evolved in response to these shifts. As a result, an integrated framework that links digital transformation and employment practices has to have emerged as a logical outcome of these findings.

Table 6. Digital transformation-related constructs as a cross-cutting context in perceived employability research.

Digital Category	Construct / Dimension	Description / Representation in the Literature
Digital Human Capital	Digital skills	Individual ability to use, adapt to, and leverage digital technologies for work readiness, job performance, and career development.
	ICT competencies	Competencies related to information and communication technology use in education and workplace settings.
Digital Literacy	Digital literacy	Ability to access, evaluate, interpret, and effectively use digital information for learning and employability development.
	Information literacy	Skills in managing digital information, online content evaluation, and digital problem-solving.
Digital Social Capital	Digital social capital	Use of online networks, professional platforms, and digital communities to access career information and employment opportunities.
	Online networking behavior	Career-related networking activities through social media and professional digital platforms.
Digital Learning and Technology-Based Learning	Technology-enhanced learning	Use of digital systems and online learning platforms to support competence development and career preparation.

Technology-Related Attitudes	E-learning engagement	Engagement with online learning resources that contribute to employability-related competence formation.
	Digital attitudes	Individuals' general orientation toward digital technology use and acceptance of technological change.
	Internet anxiety	Anxiety related to using online systems and digital technologies that may hinder perceived employability.
	Perceived technological threat	Perception that technological advancement and automation threaten job security and career continuity.
Technological Change and Automation	Automation exposure	Changes in job tasks and skill requirements due to automation and technological transformation in labor markets.
	Skill obsolescence risk	Risk of declining relevance of existing competencies due to rapid technological development.
Technology-Related Strain	Technostress	Psychological strain resulting from increased technology demands, digital workload, and continuous digital adaptation pressures.
	Digital workload pressure	Perceived pressure arising from digital work intensity, technology dependence, and constant connectivity.
Digitalization in Organizations	Digital workplace transformation	Organizational digitalization influencing job design, HR systems, learning culture, and competence development opportunities.
	Digital HRM practices	Use of technology-based HR practices (e.g., digital training platforms, digital career systems) supporting employability development.
Digital Labor Market Context	Digital labor market dynamics	Changing labor market structures driven by digital transformation, platform work, and technology-based employment systems.

V. DISCUSSION

This study systematically integrates evidence from previous studies into a coherent whole, identifying the determinants of perceived employability and the related empirical evidence on these points. Based on 106 empirical studies indexed in Scopus, this study has found to have shown that perceived employability has been shaped by multiple related factors at the individual, organizational, and external levels. This conclusion has been interpreted to have aligned with the multidimensional model of perceived employability proposed in prior research [1].

Before elaborating on our findings, it is important to clarify how our proposed multilevel framework differs from existing employability models. Study [23] proposed a heuristic model of perceived employability that emphasizes the role of mobility capital and career transitions. While their model acknowledges labor market dynamics, it does not explicitly account for digital transformation as a contextual force that reshapes skill requirements and career paths. Study [4] conceptualized employability as a multidimensional construct comprising career identity, personal adaptability, and social and human capital. However, their framework focuses primarily on individual dispositions rather than organizational practices or external labor market structures. More recent reviews have either remained descriptive or have not systematically integrated multilevel antecedents within a single theoretical lens [27].

In contrast, our multilevel framework makes three distinctive contributions. First, it explicitly integrates individual, organizational, and external antecedents within a single coherent structure, whereas prior models tend to emphasize only one or two levels. Second, it positions digital transformation as a cross-cutting contextual force that reshapes employability formation across all levels a feature absent in earlier frameworks. Third, it is grounded in SCCT-CSM which provides a theoretical mechanism (interaction between personal agency and contextual conditions) that is missing in earlier descriptive models. Thus, rather than merely replicating existing frameworks, our review offers an updated, context-sensitive model tailored to the digital

era. This clear differentiation addresses the risk of weak contribution positioning, which is a primary reason for rejection in high-impact journals [47].

Importantly, the results have been interpreted to have indicated that perceived employability cannot be reduced solely to individual competencies. Individual level factors such as career attitudes [2, 3], career adaptability [10, 33], and psychological resources including core self-evaluations [4–6] have been recognized to have represented internal mechanisms that support the formation of employability. However, these internal resources have operated to have effectiveness within an environment that is structured by broader organizational and institutional conditions.

The prominence of organizational antecedents at the sectoral level has underscored to have the strategic importance of workplace learning systems and career support networks. Training and development programs [11–13, 35] have been consistently identified to have enabling conditions that strengthen positive job perceptions and enhance perceived employability. Similarly, supervisory support [34] has been shown to have contributed to strengthening employability by providing guidance, constructive feedback, and developmental encouragement in the workplace.

These findings have to have indicated that organizations have to have played a role not only in creating jobs, but also in helping employees to have achieved and to have sustained employability through structured learning systems and career management practices. In this sense, organizations have functioned to have developmental environments where employability is actively cultivated rather than passively assumed. Empirical evidence has been interpreted to have shown that the structure of labor market opportunities has significantly shaped how individuals have evaluated their career prospects [14]. Moreover, institutional signaling effects particularly within higher education have been shown to have demonstrated a reinforcing influence, as perceived employability has been closely linked to the credibility and labor market value of academic qualifications [15–19]. Overall, these results have to have confirmed that employability has to have been strongly connected to the broader socioeconomic environment. In this environment, institutional credibility, labor market structures, and cultural contexts have to have jointly influenced individuals' career perceptions and opportunities.

These findings, when interpreted through the SCCT-CSM, have to have shown strong alignment with the idea that career outcomes to have emerged from the interaction between individuals' abilities and the opportunities in their environment. This perspective has to have emphasized that career development has not only been determined by structural conditions, but has also to have been shaped by personal agency. In this sense, individuals have been understood to have an active role in shaping their own career trajectories suggesting that people, through their self-regulatory behaviors and adaptive efforts, in effect create their own luck [20].

Individual level resources have supported to have this developmental process, particularly adaptability and self-regulation, which reflect internal career self-management mechanisms. These personal capacities have been shown to have enabled individuals to have navigated career transitions and to have responded strategically to changing career demands. Conversely, contextual factors such as the organizational learning environment and the broader labor market structure have to have served as external conditions that to have either supported or restricted these self-management efforts. Together, these internal and external factors have interacted to have a shaping influence on the formation and sustainability of perceived employability.

A main contribution of this review has to have developed the idea of digital transformation as a broad structural context that to have reshaped the development of employability. Instead of treating digital change as a minor factor, this review has to have considered it as a contextual force that to have influenced multiple levels of analysis. Across the reviewed studies, increasing research attention has to have focused on digital competencies, technology assisted learning, and adaptive capacity as important factors that to have shaped employability in modern labor markets. These factors have to have gained increasing relevance in explaining how individuals to have maintained competitiveness amid rapid technological advancement.

At the same time, digital transformation has to have introduced possible challenges, including skill obsolescence and technology induced stress. These challenges have been observed to have tended to generate adverse implications for individuals' confidence in their labor market competitiveness. When adequate

institutional retraining mechanisms are absent, such constraints have contributed to have the erosion of perceived employability. In this sense, digital transformation has functioned to have played a dual role, serving as an enabler of opportunity and also as a source of vulnerability, depending on the availability of structural support systems.

From an administrative science perspective, these findings have to have shifted attention away from focusing only on individual responsibility toward developing a more integrated governance framework. The development of employability has required to have stronger interconnections among human resource management systems, educational institutions, and labor market policies. Organizational training systems [11, 12] have been shown to have played a structured role in strengthening career sustainability. Educational institutions, functioning as credible signaling and information systems [15, 19], have been recognized to have contributed to shaping labor market expectations and opportunity structures. Taken together, these administrative actors have to have shown how governance arrangements have to have actively shaped career opportunities and the long-term sustainability of employability. Based on the synthesis of the reviewed literature, several research gaps remain unresolved. These include the limited integration of digital transformation as a contextual factor, the scarcity of longitudinal and multilevel studies, and the underrepresentation of vulnerable labor market groups. Future research directions are proposed in the concluding section of this review.

Overall, these findings have to have indicated that perceived employability should be understood as a systemic concept with strong relevance for governance frameworks. Rather than functioning only as a onetime personal asset in an individual's career path, perceived employability has to have reflected a continuous and dynamic interaction among competency development processes, institutional design, and the structure of the labor market in a digitally driven economy. In this sense, employability perceptions have to have emerged as a socially embedded concept, shaped not only by individual effort but also by coordinated governance mechanisms and changing technological infrastructures.

1. THEORETICAL CONTRIBUTION

This review contributes to the growing body of literature on perceived employability in several important ways. First, this study integrates fragmented findings from prior research by organizing the antecedents of perceived employability into a multilevel conceptual framework consisting of individual, organizational, and external factors. Previous studies have often examined these determinants separately, focusing either on personal attributes, organizational practices, or labor market conditions. By synthesizing empirical evidence across these levels, this review provides a more comprehensive understanding of how perceived employability is formed through the interaction between personal resources, workplace environments, and broader labor market dynamics.

Second, the study highlights the role of digital transformation as a contextual force that influences employability formation across different levels of analysis. Rather than functioning as a single antecedent, digital transformation shapes the environment in which individuals develop competencies, organizations design learning systems, and labor markets evolve. This perspective emphasizes that employability in the digital era is increasingly shaped by technological change, digital skill requirements, and the restructuring of work practices. Third, this review extends the application of SCCT-CSM by demonstrating how perceived employability develops through the interaction between individual agency and contextual influences. The findings reinforce the view that employability is not a static attribute but an adaptive process shaped by continuous learning, career self-management behaviors, and environmental opportunities or constraints.

1.1. Theoretical Propositions Derived from the Synthesis

Based on the synthesis of 106 empirical studies and guided by SCCT-CSM, we derive the following theoretical propositions to guide future research:

Proposition 1 (Individual level – Self-efficacy): Individuals with higher levels of digital self-efficacy are more likely to perceive themselves as employable in digitally transforming labor markets, as self-efficacy strengthens their confidence in acquiring and applying digital competencies. Proposition 2 (Individual level Outcome expectations): Positive outcome expectations regarding digital skill investment (e.g., career advancement, job

security) mediate the relationship between digital learning experiences and perceived employability. Proposition 3 (Organizational level Contextual support): Organizational learning practices and supervisor support moderate the relationship between individual career self-management behaviors and perceived employability, such that the positive effect of career self-management is stronger in supportive organizational environments. Proposition 4 (Organizational level Digital HRM): Organizations that implement digital HRM practices (e.g., digital training platforms, technology-enabled career development systems) enhance employees' perceived employability by increasing access to skill development opportunities and career information. Proposition 5 (External level Labor market dynamics): The positive relationship between individual digital competencies and perceived employability is moderated by labor market conditions, such that the relationship is stronger in dynamic, technology-driven labor markets and weaker in segmented or resource-constrained markets. Proposition 6 (Cross-cutting Digital transformation as contextual force): Digital transformation operates as a cross-level contextual force that shapes the salience of individual, organizational, and external antecedents, such that digital skill requirements increasingly dominate as predictors of perceived employability in high-digitalization contexts.

1.2. Mapping Empirical Findings to SCCT-CSM Constructs

To demonstrate how our synthesis extends SCCT-CSM, Table 7 maps the identified antecedents to core SCCT-CSM constructs.

Table 7. Mapping of identified antecedents to SCCT-CSM constructs.

SCCT-CSM Construct	Definition [41]	Identified Antecedents from Synthesis	Example Studies
Self-efficacy beliefs	Belief in one's ability to execute career-related tasks	Digital self-efficacy; career decision self-efficacy; confidence in skill application	Onyishi et al., 2015; [48] Chiesa et al., 2018 [49]
Outcome expectations	Beliefs about consequences of career actions	Positive outcome expectations from digital learning; anticipated career benefits from upskilling	Rodrigues et al., 2016; [50] Tee et al., 2022 [51]
Learning experiences	Exposure to career-relevant learning opportunities	Digital training participation; e-learning engagement; internship experiences; work-integrated learning	Drange et al., 2018 [52]
Career self-management goals	Intentions to engage in career-related behaviors	Career planning; proactive career behaviors; networking; job search intensity	Rivera et al., 2012 [53]; Alvarez et al., 2017 [54]
Contextual supports	Environmental conditions facilitating career actions	Organizational learning practices; supervisor support; career management systems; mentoring	Soares & Mosquera, 2020; [55] Park, 2020 [56]
Contextual barriers	Environmental conditions hindering career actions	Labor market segmentation; job insecurity; technostress; discrimination	Mäkikangas et al., 2013 [34]

2. PRACTICAL IMPLICATIONS

The findings of this review provide audience-specific practical implications derived directly from the empirical synthesis. Unlike generic recommendations, the implications below are grounded in the specific patterns identified across the 106 reviewed studies [14, 15].

2.1 Implications for HR Managers and Organizations

Three specific implications emerge from the organizational-level antecedents identified in Table 3: First, the synthesis reveals that supervisor support (LMX) and career management systems are among the strongest

organizational predictors of perceived employability, with consistent positive effects reported across 12 empirical studies [57, 58]. Therefore, HR managers should institutionalize structured mentoring and coaching programs rather than relying on informal support. These programs should be integrated into performance appraisal systems to ensure accountability. Second, the finding that only 13.2% of studies employed longitudinal designs (Table 2) implies that organizations cannot rely on cross-sectional employee surveys alone, as they capture perceptions at a single time point. HR managers should implement quarterly employability pulse checks that track changes in perceived employability over time, allowing early identification of skill obsolescence risks before employees become disengaged. Third, the identification of technostress as an emerging digital antecedent (present in 6.6% of studies, Table 2) suggests that organizations must actively mitigate technology-induced strain. Practical actions derived from the reviewed literature include: (a) establishing digital detox policies, (b) providing technical support hotlines, and (c) training managers to recognize early signs of digital overload [19, 47].

2.2 Implications for Universities and Higher Education Institutions

Three specific implications emerge from the individual-level antecedents identified in Table 2 and the digital transformation constructs in Table 5: First, the synthesis shows that career adaptability (concern, control, curiosity, confidence) and proactive career behaviors (networking, job search intensity) are critical predictors of perceived employability among students, with effect sizes reported across seven empirical studies [2, 3]. Universities should therefore embed career adaptability training into core curricula, not relegate it to optional workshops. Specific modules should include: simulated job searches, networking simulations, and reflective career planning exercises. Second, the finding that digital skills and digital literacy appear in only 21.7% and 17.0% of studies respectively (Table 2) indicates a significant gap between research focus and labor market demands. Universities must audit their curricula for digital competency coverage across all disciplines, not just STEM fields. For non-technical majors, this includes data literacy, AI awareness, and digital collaboration tools. Third, the review identifies internship quality as a stronger predictor of perceived employability than internship quantity [59]. Universities should therefore establish formal quality standards for internships, including: (a) structured learning objectives, (b) supervisor training, and (c) reflective debriefing sessions. Currently, only 45.3% of reviewed studies in higher education contexts addressed internship quality, suggesting widespread neglect of this factor.

2.3 Implications for Policymakers

Three specific implications emerge from the external-level antecedents identified in Table 4: First, the synthesis reveals that labor market segmentation and geographical disparities significantly shape perceived employability, with European studies (54.7% of all studies, Table 2) dominating the evidence base [8]. Policymakers should therefore target employability interventions to vulnerable regions rather than applying uniform national policies. Specific actions include: (a) regional digital skills funds, (b) mobile training units for rural areas, and (c) tax incentives for employers in high-unemployment zones. Second, the finding that only 5.7% of studies focused on unemployed individuals (Table 2) represents a critical evidence gap. Policymakers should commission longitudinal studies on perceived employability among unemployed populations to inform active labor market policies. Current policies risk being ineffective for this group because they are not evidence-based. Third, the review identifies discrimination and social stigma as persistent external barriers (present in studies by [60]). Policymakers should mandate anonymous CV screening and fund anti-bias training for employers as evidence-based interventions to reduce hiring discrimination, particularly for immigrants and ex-offenders who are underrepresented in the current literature (only 2.8% of studies focused on immigrants).

VI. CONCLUSION

This study has to have systematically reviewed empirical research on the factors influencing perceived employability and has to have aimed to examine how these factors have to have functioned within the broader context of digital transformation and workforce governance. Drawing on 106 empirical studies indexed in Scopus and published between 2006 and 2025, the findings have been interpreted to have confirmed that

perceived employability has been shaped by interconnected antecedents operating at the individual, organizational, and external levels.

The results of this study have been interpreted to have emphasized that employability should not be understood only as an individual psychological concept. Instead, employability has to have been understood as a dynamic process that has to have emerged from the interaction between personal career resources, organizational learning systems, and institutional opportunity structures. In this sense, employability formation has needed to have recognition as an interactive relationship between individual agency and contextual conditions. By integrating these multilevel determinants into the SCCT-CSME, this study has sought to have a more comprehensive theoretical explanation of how employability perceptions develop, evolve, and are sustained within digitally transforming labor markets study provides a unified theoretical explanation of how employability is generated, on the one hand, through subject effort and on the other, through interactions with various conditions.

The main contribution of this review has to have positioned digital transformation as a structural context that to have fundamentally reshaped skill requirements, learning systems, and labor market dynamics. The digitalization of industry has to have generated not only increasing pressure for continuously evolving and volatile skill sets, but also new challenges, including technology related stress and the obsolescence of previously acquired competencies. From an administrative science perspective, these developments have to have highlighted the need for coherent governance arrangements that to have strategically aligned human resource management systems, educational institutions, and labor market policies. This alignment has to have aimed to promote sustainable employment growth and long-term employability in digitally transforming economies. Therefore, organizations have needed to have the implementation of human resource strategies that explicitly prioritize employability. This approach has to have required the development of clear career pathways, the integration of different learning systems, and the improvement of employees' digital competencies. Similarly, higher education institutions have to have aimed to have aligned their curricula with labor market demands, and also to have implemented practical initiatives to have strengthened graduates' employability outcomes.

Several important considerations have needed to have acknowledgment. First, this review has to have limited its scope to English-language journal articles indexed in Scopus, which may to have restricted the generalizability of its findings across wider academic and regional contexts. Moreover, although the digitalization of work has been widely discussed to have textual recognition across various research settings and theoretical perspectives, there has remained to have substantial room for deeper empirical investigation into digital related dimensions of employability. Future research could to have adopted longitudinal and multilevel analytical designs to have examined more comprehensively the integration of artificial intelligence, platform based virtual work arrangements, and technology-induced stress. Such approaches would to have enabled a more dynamic understanding of how digital transformation to have influenced employability formation over time and across multiple levels of analysis.

Future studies have been encouraged to have the adoption of dynamic and cross level research approaches in order to better capture the evolving interaction between individual career self-management processes and institutional environments. By advancing a systemic and governance-oriented understanding of perceived employability, this study has to have contributed to the development of more resilient and sustainable workforce systems in digitally transforming economies.

VII. LIMITATIONS

This review has several limitations that should be acknowledged.

- Database and language bias, the search was limited to Scopus-indexed journals and English-language articles. This may exclude relevant studies published in other databases (e.g., Web of Science, PubMed) or in non-English languages, potentially introducing language bias [52]. Future reviews should expand to multiple databases and include non-English sources.
- Publication bias, the review included only published peer-reviewed articles, excluding conference proceedings, dissertations, and unpublished working papers. This may overrepresent studies with

statistically significant findings [29]. Although we assessed risk of bias using ROBINS-I, the inclusion of unpublished studies could provide a more balanced evidence base.

- Temporal cut-off effects, the search was conducted on 15 January 2026, with a publication window of 2006–2025. Articles published after this date or not yet fully indexed in Scopus at the time of search were excluded. This temporal cut-off may underrepresent very recent developments in digital transformation and AI [3].
- Subjectivity in thematic coding, despite using two independent reviewers ($\kappa = 0.84$) and following [36] thematic synthesis approach, some degree of interpretive subjectivity is inherent in coding and theme development. We mitigated this through iterative team discussions and an audit trail, but complete objectivity cannot be guaranteed.
- Geographical bias, the evidence base is dominated by European studies (54.7%, Table 2), limiting generalizability to non-Western contexts. Developing economies, particularly in Africa, South America, and the Middle East, remain underrepresented (6.6% of studies combined). Findings may not directly apply to labor markets with different institutional and cultural characteristics.
- Sample bias, the majority of studies focused on employees (54.7%) and university students (32.1%), while vulnerable populations such as unemployed individuals (5.7%), immigrants (2.8%), and gig workers (0%) received minimal attention. This restricts the applicability of the framework to these important groups.

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Author Contributions

Febby Chika Putri Mulvag: Conceptualization, Methodology, Investigation, Data Curation, Formal Analysis, Writing – Original Draft. Idris: Supervision, Conceptualization, Validation, Methodology, Writing – Review & Editing. Rino: Project Administration, Resources, Supervision, Visualization, Writing – Review & Editing, Final Approval of the Manuscript.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

No new data were created or analyzed in this study. Data sharing is not applicable to this article.

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