

Research paper

Artificial Intelligence and International Students' Career Choices: STEM and Healthcare as Sustainable Career Pathways

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ABSTRACT

Artificial intelligence (AI) is rapidly transforming global labor markets, higher education, and workforce expectations, creating new challenges for international students' educational planning, employability, immigration pathways, and long-term career sustainability. Guided by Social Cognitive Career Theory (SCCT) and Human Capital Theory (HCT), this integrative literature review synthesizes empirical research, workforce reports, and policy analyses to examine how AI-driven technological disruption influences educational decision-making, career development, and workforce preparedness among international students. Findings identify several emerging trends, including growing demand for AI literacy, interdisciplinary competencies, adaptability, and continuous lifelong learning. STEM and healthcare disciplines currently demonstrate comparatively strong resilience to AI-driven labor-market disruption because of projected employment growth, complementarity between professional expertise and AI technologies, and post-graduation immigration opportunities through pathways such as Optional Practical Training (OPT) and STEM OPT extensions. The review further indicates that career sustainability increasingly depends on combining advanced technical competencies with uniquely human capabilities, including critical thinking, communication, ethical reasoning, leadership, adaptability, and cross-cultural collaboration. Building on these findings, the study proposes an integrated conceptual model combining SCCT and HCT to explain how self-efficacy, outcome expectations, educational investments, and contextual factors shape career decision-making in AI-driven economies. The review also distinguishes evidence based on direct labor-market projections from insights derived from adjacent literatures and the authors' conceptual synthesis. Practical implications are offered for higher education institutions, career services, policymakers, and international students seeking to strengthen workforce readiness, informed career decision-making, and long-term career success in an increasingly AI-enabled global economy.

Keywords: artificial intelligence, international students, STEM education, healthcare education, career development, workforce transitions, employability, global labor market

Artificial intelligence (AI) refers to computational systems capable of performing tasks that typically require human intelligence, including learning, reasoning, problem-solving, language processing, prediction, and decision support (Russell & Norvig, 2021). The Organization for Economic Co-operation and Development (OECD) similarly defines an AI system as a machine-based system that can, for explicit or implicit objectives, infer from the inputs it receives how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments (OECD, 2024). AI has emerged as a general-purpose technology reshaping industries by automating routine tasks, augmenting human capabilities, and creating demand for new skills and occupations (Acemoglu & Restrepo, 2019; Brynjolfsson & McAfee, 2014). Its influence extends beyond workplace productivity into higher education, where AI increasingly informs curriculum design, student advising, assessment practices, and the development of competencies aligned with evolving labor market needs.

These developments have generated significant opportunities for innovation and productivity while simultaneously creating uncertainty regarding future employment prospects, particularly for students preparing to enter increasingly technology-driven labor markets. Recent workforce projections estimate that approximately 30% of current U.S. jobs could be automated by 2030, and several analyses report a marked decline in entry-level postings—the traditional gateway for new graduates—as employers adopt AI-enabled screening and productivity tools (Kaplan & Haenlein, 2019; McKinsey, 2025; Stone et al., 2024). AI also affects employability by reshaping the skills employers value, increasing the importance of digital literacy, adaptability, and interdisciplinary competencies. Workers are increasingly expected to complement AI technologies rather than compete directly with them, making lifelong learning and workforce reskilling critical components of career development (World Economic Forum, 2025). As labor markets evolve, AI simultaneously creates new occupations and transforms or displaces existing roles, with direct consequences for career pathways, professional mobility, and institutional efforts to prepare graduates for emerging opportunities. Consequently, the intersection of technological disruption, educational decision-making, and workforce transitions has become an increasingly important area of inquiry.

The implications of AI-driven transformation are especially consequential for international students pursuing higher education in the United States. International students contribute substantially to the academic, economic, and research missions of U.S. higher education institutions, with enrollment reaching a record high of more than 1.1 million students during the 2023–2024 academic year (Institute of International Education, 2024) and approximately 1.2 million students during the 2024/25 academic year (Institute of International Education, 2025). International students are individuals who have crossed a national or territorial border to pursue education and are enrolled in an institution outside their country of origin (Gjini, 2023; United Nations Educational, Scientific and Cultural Organization [UNESCO], 2012). In the U.S. higher education context, they are most precisely defined as non-U.S. citizens enrolled at U.S. colleges and universities who hold nonimmigrant student status—principally F-1 (academic student) or M-1 (vocational student) status, and, when enrolled as degree- or certificate-seeking students, J-1 (exchange visitor) status (Gjini, 2023; Korobova, 2012; United States Citizenship and Immigration Services [USCIS], 2020). This student-status definition is distinct from temporary employment-based nonimmigrant categories such as the H-1B visa: individuals in H visa status are typically employed professionals rather than currently enrolled students, even though many H-1B holders originally entered the United States as F-1 or J-1 international students. Throughout this review, references to "international students" denote individuals in F-1, M-1, or student-focused J-1 status; subsequent employment-based statuses (e.g., H-1B) are discussed separately as post-graduation workforce and immigration outcomes rather than as part of the international-student population itself. Although F-1 and J-1 visas are formally classified as nonimmigrant, single-intent statuses, research indicates that a substantial proportion of senior international students come to hold or develop an intent to work and remain in the U.S. after completing their studies (Gjini, 2023); because this finding derives from a relatively small sample at a single institution, it should be interpreted as suggestive rather than generalizable to the broader international student population. As they pursue better educational opportunities and stronger career prospects in the U.S., international students tend to experience greater socio-cultural, linguistic, economic, and vocational challenges than their U.S. domestic peers,

including additional constraints related to visa status and immigration regulation (Gjini, 2023; Gjini & Hernandez-Gantes, 2025; Hazen & Alberts, 2006).

Within this context, remaining competitive in the labor market requires international students to evaluate the long-term value of different academic pathways. Educational choices carry implications that extend beyond immediate employment outcomes to include immigration opportunities, professional mobility, and long-term career sustainability (Gjini, 2023). Disciplines within science, technology, engineering, and mathematics (STEM) and healthcare have attracted growing attention because they are associated with strong labor market demand, relatively high employment stability, and opportunities for professional advancement within AI-integrated environments (Moriarty, 2024; She & Wotherspoon, 2013). At the same time, these fields increasingly require a combination of technical expertise and human-centered competencies, including communication, ethical reasoning, leadership, and cross-cultural collaboration (Abina et al., 2024; Althubiani, 2026).

AI-driven labor market change also carries implications for immigration-related opportunity. Countries seeking to remain globally competitive increasingly design immigration policies that prioritize highly skilled individuals in STEM and AI-related fields. Consequently, proficiency in AI-related competencies may enhance international graduates' employability and access to skilled-migration pathways, while also shaping talent mobility and global competition for specialized expertise. In this sense, AI functions not merely as a technological innovation but as a transformative force shaping educational outcomes, workforce development, and immigration opportunity within an increasingly interconnected global economy (Gjini & Gjini, 2026).

Understanding how international students make educational and career decisions within this environment requires a multidisciplinary theoretical perspective. Social Cognitive Career Theory (SCCT) provides a framework for examining how self-efficacy beliefs, outcome expectations, and contextual influences shape career interests and educational choices. Human Capital Theory (HCT) complements this perspective by explaining how investments in education and skill development enhance individual productivity and labor market value. Together, these frameworks offer a lens for analyzing the factors influencing international students' educational decisions and workforce preparedness in an era of rapid technological change.

The purpose of this integrative review is to synthesize current literature on the influence of AI on international students' educational and career choices, with particular attention to the role of STEM and healthcare pathways in promoting career sustainability. Specifically, this review examines how AI-driven labor market transformation affects academic decision-making, employability, workforce transitions, and immigration-related opportunities. By integrating career development theory, human capital theory, workforce research, and higher education scholarship, this review offers evidence-based recommendations for students, higher education institutions, and policymakers seeking to support successful career outcomes in increasingly AI-driven economies.

THEORETICAL FRAMEWORK

Social cognitive career theory (SCCT)

Social Cognitive Career Theory (SCCT), developed by Lent, Brown, and Hackett (1994) and grounded in Bandura's (1986, 1997) Social Cognitive Theory, provides a framework for understanding how individuals develop career interests, make educational and occupational choices, and pursue career success through the dynamic interaction of personal, behavioral, and environmental factors. The theory proposes that career-related behaviors are shaped by three central cognitive mechanisms: self-efficacy beliefs, outcome expectations, and personal goals (Lent et al., 1994, 1996). Self-efficacy refers to an individual's confidence in their ability to successfully perform tasks necessary to achieve specific career objectives. Outcome expectations represent beliefs about the likely consequences of engaging in certain behaviors, while goals reflect individuals' intentions to pursue specific educational or occupational pathways (Gjini, 2023). Together, these factors influence the formation of career interests, career decision-making processes, and persistence toward career-related objectives (Lent et al., 1994, 2000).

A central contribution of SCCT is its recognition of contextual influences on career development. The theory acknowledges that environmental supports and barriers—such as institutional resources, social support networks, financial constraints, cultural factors, and labor market conditions—can facilitate or hinder career-related behaviors and outcomes (Lent et al., 2000, 2001). SCCT further posits that individual characteristics, including gender, race, ethnicity, nationality, and prior learning experiences, interact with environmental conditions to shape self-efficacy beliefs and outcome expectations, ultimately influencing educational and career choices (Brown & Lent, 1996; Duong & Tran, 2024; Lent et al., 2002).

Within higher education, SCCT has been widely applied to explain students' engagement in career preparation activities, including internships, experiential learning opportunities, and career development programs (Gjini, 2023). Positive educational experiences and institutional support can strengthen students' self-efficacy and outcome expectations, increasing their motivation to pursue career-related opportunities and their readiness for workforce transitions (Domínguez et al., 2020). Conversely, perceived barriers such as discrimination, financial challenges, limited access to professional networks, and cultural or language obstacles may reduce self-efficacy and impede students' ability to translate career interests into concrete goals and actions (Lent et al., 2001; Lent & Brown, 2019).

SCCT is particularly relevant for understanding the career development experiences of diverse and underrepresented populations, including international students, who often encounter unique cultural, social, financial, and employment-related barriers that shape their career decision-making, self-efficacy, and workforce transition experiences (Domínguez et al., 2020; Gjini, 2023; Gjini & Hernandez-Gantes, 2025; Lent et al., 2001). In these contexts, institutional support systems and career development interventions play a critical role in fostering coping efficacy, strengthening self-efficacy beliefs, and promoting successful educational and career outcomes (Domínguez et al., 2020). More broadly, SCCT offers a framework for examining how personal beliefs, contextual factors, and learning experiences collectively shape career development, including in an era increasingly shaped by artificial intelligence (Gjini, 2023; Gjini & Hernandez-Gantes, 2025; Lindblom-Ylänne et al., 2019; Varunki et al., 2017; Zhao et al., 2021).

Applied to the present context, international students' confidence in navigating AI-driven labor markets is shaped jointly by institutional support and technological exposure. Students who perceive STEM and healthcare as stable, high-demand fields tend to develop stronger career self-efficacy and outcome expectations, which in turn shape how they evaluate educational pathways and long-term career prospects (Emerson et al., 2026; Yao & McWha-Hermann, 2025). Consistent with this view, international students' gravitation toward STEM and healthcare education can be understood as a strategic response to the opportunities and challenges that AI-driven transformation presents (Domínguez et al., 2022; Pham et al., 2024; Sheu & Bordon, 2017; Wang et al., 2022).

First, SCCT suggests that self-efficacy plays a central role in career decision-making. International students who possess confidence in their ability to navigate technology-rich environments and adapt to AI-integrated workplaces are more likely to pursue STEM and healthcare disciplines (Emerson et al., 2026). Higher levels of career self-efficacy encourage proactive career behaviors, including seeking internships, engaging in professional networking, developing AI-related competencies, and actively exploring employment opportunities—actions that enhance career readiness and improve students' ability to compete in evolving labor markets (Sheu & Bordon, 2017).

Second, outcome expectations significantly influence educational choices. International students increasingly perceive STEM and healthcare fields as offering strong employment prospects, competitive salaries, and comparatively greater protection from AI-driven job displacement. While AI is transforming many occupations, these disciplines are viewed as relatively resilient because they require advanced technical expertise, critical thinking, complex problem-solving, and human-centered skills that remain difficult to automate (Awu et al., 2025; Emerson et al., 2026). STEM and healthcare careers also tend to offer more favorable immigration and visa opportunities, further strengthening students' commitment to these pathways (Domínguez et al., 2022; Duong & Tran, 2024; Sheu & Bordon, 2017; Thapa et al., 2025).

Third, SCCT highlights the importance of contextual factors in career development. International students face distinct barriers, including visa restrictions, immigration uncertainty, cultural adaptation challenges, and language differences. At the same time, supportive institutional resources, mentoring, and

AI-enabled career development tools can enhance students' confidence and career preparedness (Duong & Tran, 2024). AI therefore functions as both a support and a challenge: it can provide personalized guidance and skill-development opportunities, yet algorithmic hiring systems and concerns about automation may simultaneously increase uncertainty regarding future employment (Duong & Tran, 2024; Wang et al., 2026).

Finally, SCCT provides a framework for assessing career readiness and professional development. Measures such as the Career Decision-Making Self-Efficacy Scale evaluate competencies related to self-appraisal, occupational information gathering, goal setting, planning, and problem-solving. These competencies are strongly associated with participation in internships and experiential learning opportunities, which are particularly important for international students seeking to build professional networks, gain practical experience, and improve employability in AI-transformed labor markets (Lent & Brown, 2019; Wang et al., 2026).

Overall, SCCT helps explain why STEM and healthcare education have emerged as attractive and comparatively sustainable pathways for many international students. Their choices are not made in a vacuum; rather, they reflect a dynamic interaction between personal beliefs about competence and expectations about the future. By fostering self-efficacy, offering favorable outcome expectations, and providing relative resilience against automation, these fields are increasingly viewed as strategic educational investments in an era of AI-driven workforce transformation (Lent & Brown, 2019).

Human capital theory

Human Capital Theory (HCT) provides a complementary framework for understanding how international students make educational and career decisions in response to AI-driven labor market transformation. Originally developed by Becker (1993) and Schultz (1961), HCT posits that investments in education, training, and skill development enhance an individual's productivity, employability, and economic value. Within contemporary knowledge economies, educational attainment functions not only as a mechanism for personal development but also as a strategic investment designed to increase labor market competitiveness and long-term career returns (Ajuzieogu, 2025; Awu et al., 2025; Ntsanwisi, 2025).

In the context of AI-driven workforce transformation, the concept of human capital has expanded beyond traditional academic credentials. Employers increasingly seek workers who possess advanced digital competencies, data literacy, technological adaptability, and interdisciplinary problem-solving abilities (Al Aina, 2026). Consequently, human capital in the twenty-first century encompasses not only formal education but also the capacity for continuous learning, innovation, and adaptation within rapidly evolving technological environments (World Economic Forum [WEF], 2025). For international students, educational decisions are therefore shaped by the perceived ability of specific academic pathways to generate sustainable career opportunities and enhance labor market resilience in the face of automation and technological disruption (Al Aina, 2026; Awu et al., 2025; Ntsanwisi, 2025).

Human capital in the age of artificial intelligence

In the AI era, human capital investments increasingly center on competencies that complement rather than compete with automation technologies (Lin et al., 2025; Portocarrero Ramos et al., 2025; Shapiro et al., 2026). Digital and AI literacy have emerged as essential forms of human capital, with professionals across industries expected to understand, use, and collaborate with AI-enabled systems. Equally important is the capacity for lifelong learning, given the accelerating pace of technological change and the continuous evolution of workplace skill requirements (Awu et al., 2025; Eide & Showalter, 2010).

Moreover, contemporary human capital increasingly integrates technical and human-centered competencies. Organizations seek professionals who can combine expertise in data analytics, machine learning, and computational thinking with communication, leadership, ethical reasoning, and cross-cultural collaboration (Polzer, 2023; Schmager et al., 2025). This convergence reflects a broader shift toward interdisciplinary skill sets that enable individuals to operate effectively within complex technological and

organizational environments (Awu et al., 2025; Jaiswal et al., 2022; Portocarrero Ramos et al., 2025; Rabie et al., 2026; Zárate-Torres et al., 2025).

STEM and healthcare education as strategic human capital investments

From an HCT perspective, STEM and healthcare disciplines represent particularly valuable educational investments because they are associated with strong labor market returns and comparative resilience to technological disruption. Occupations in data science, cybersecurity, artificial intelligence, biotechnology, bioinformatics, and healthcare are projected to experience sustained demand as organizations continue to adopt advanced technologies and respond to demographic change (Sezgin, 2023; U.S. Bureau of Labor Statistics [BLS], 2025a; Wang & Lu, 2025; WEF, 2025).

Importantly, although AI is poised to reshape many occupations, it has generally functioned as a complementary rather than a replacement technology within STEM and healthcare professions (Emerson et al., 2026). In healthcare, AI enhances diagnostic capabilities, administrative efficiency, and clinical decision-making while the central role of human judgment, empathy, and patient-provider relationships remains intact (Jafari et al., 2025; Sezgin, 2023; Sharma, 2024). Similarly, STEM professionals increasingly work alongside AI systems to design, optimize, and manage technological innovations. As a result, these fields currently offer international students comparatively greater employment stability and reduced vulnerability to automation-related displacement (Sharma, 2024; Wang & Lu, 2025).

STEM and healthcare qualifications also possess a comparatively high degree of global transferability. Technical and clinical competencies tend to be recognized across national boundaries and industries, increasing labor mobility and providing graduates with broader opportunities in international labor markets. Consequently, these educational pathways constitute a comparatively robust form of human capital for students seeking long-term career sustainability and global professional mobility (Faiyazuddin et al., 2025; Jafari et al., 2025; Wang & Lu, 2025).

Educational investments as immigration capital

For international students, educational choices frequently function not only as investments in human capital but also as investments in what might be termed immigration capital. Educational credentials acquired in the United States can increase access to employment-based immigration pathways and enhance opportunities for long-term labor market integration. STEM degrees provide a significant advantage through eligibility for the STEM Optional Practical Training (OPT) extension, which allows graduates additional time to gain professional experience and pursue employer-sponsored visas such as the H-1B (Bound et al., 2021; Faiyazuddin et al., 2025; Hanson & Slaughter, 2017; Oh, 2025).

Similarly, persistent labor shortages in healthcare professions have increased demand for internationally educated nurses and healthcare practitioners, creating additional pathways to employment and immigration sponsorship. Research suggests that international students increasingly perceive healthcare careers as associated with comparatively favorable opportunities to pursue work authorization and, in some cases, permanent residency through employment-based immigration programs, including for certain advanced-practice roles the National Interest Waiver (Bound et al., 2021; Camacho, 2025; Lee & Lee, 2022; Oh, 2025; Portocarrero Ramos et al., 2025). Eligibility for these pathways depends on individualized factors such as occupation, credentials, employer sponsorship, and adjudicatory discretion, and immigration policy in this area is complex and subject to change; no degree or occupation, including those in healthcare, automatically confers immigration eligibility, and readers should verify current requirements against authoritative U.S. government sources such as USCIS before drawing individualized conclusions. From an HCT perspective, selecting STEM and healthcare majors can nonetheless be understood as a strategy that may help maximize both economic returns and immigration-related opportunities, while the uncertainties and evolving nature of immigration systems are acknowledged (Faiyazuddin et al., 2025).

Human capital and structural inequalities

Although HCT emphasizes the benefits of educational investment, it also provides a framework for examining structural inequities that affect the accumulation and utilization of human capital. A significant challenge is disparity in access to digital resources and technological education. Students from under-resourced educational systems may enter higher education with lower levels of digital literacy and technological preparedness, potentially limiting their ability to compete effectively in AI-intensive labor markets (Awu et al., 2025; Bound et al., 2021; Eide & Showalter, 2010; Oh, 2025).

Emerging recruitment technologies may further constrain the realization of human capital among international graduates. AI-powered applicant tracking systems and algorithmic hiring platforms often rely on standardized screening criteria that may disadvantage candidates with nontraditional educational backgrounds, international credentials, or linguistic differences. As a result, highly qualified international students may encounter barriers that limit the recognition and conversion of accumulated human capital into employment opportunities (Hanson & Slaughter, 2017; Oh, 2025).

Implications for higher education and employers

HCT also informs the strategic decisions of educational institutions and employers. Universities play a critical role in developing workforce-relevant human capital and are increasingly challenged to redesign curricula that integrate AI literacy, data analytics, computational thinking, and interdisciplinary competencies. Aligning educational programs with emerging labor market demands can enhance graduate employability and improve workforce readiness in an AI-driven economy.

Likewise, organizations that invest in employee development through upskilling and reskilling initiatives strengthen their competitive advantage by ensuring that workers possess the knowledge and competencies required to adapt to technological change. Such investments reflect the core assumptions of HCT, which maintains that continuous learning and skill acquisition contribute to both individual productivity and organizational performance (Awu et al., 2025).

Taken together, HCT helps explain why STEM and healthcare education currently function as comparatively strategic human capital investments for many international students; the Discussion section below situates this pattern alongside SCCT and considers its practical and immigration-related implications in greater depth (Awu et al., 2025).

METHODS

This study employed an integrative literature review methodology combined with a policy analysis framework to examine the implications of AI for educational decision-making, career development, workforce transitions, and immigration pathways among international students. The integrative review approach was selected because it permits the synthesis of evidence from diverse methodological traditions, including empirical studies, policy reports, labor market analyses, and workforce forecasts, thereby providing a comprehensive understanding of emerging trends across educational and employment systems (Snyder, 2019; Torraco, 2016).

Literature search strategy

A comprehensive and systematic literature search was conducted across six academic databases: Scopus, Web of Science, ERIC, PsycINFO, Education Source, and Google Scholar. Additional sources were identified through reference-list ("snowball") searches and through reports published by the U.S. Bureau of Labor Statistics (BLS) and international organizations, including the United Nations Educational, Scientific and Cultural Organization (UNESCO), the Organisation for Economic Co-operation and Development (OECD), the International Monetary Fund (IMF), and the World Economic Forum (WEF). Data were collected from multiple sources, including peer-reviewed scholarly publications, government reports, labor market statistics, and international workforce assessments. Key sources included publications from the 2025 BLS and WEF reports and other governmental and professional organizations that monitor workforce development and technological transformation. Literature was identified through systematic searches of the

databases and organizational repositories listed above using keyword combinations related to artificial intelligence, international students, multilingualism, employability, career development, algorithmic hiring, Applicant Tracking Systems, career sustainability, Human Capital Theory, Social Cognitive Career Theory, labor market transformation, higher education, immigration policy, and workforce development. Representative search strings included "artificial intelligence" AND "international students"; "career sustainability" AND STEM; "Social Cognitive Career Theory" AND career development; "Human Capital Theory" AND international student mobility; and algorithmic hiring AND international graduates. Because scholarship on artificial intelligence and workforce transformation is evolving rapidly, the search prioritized literature published between 2018 and 2026, with an emphasis on sources from 2023 onward; foundational theoretical works predating this range (e.g., original statements of SCCT and HCT) were retained regardless of publication date. The literature search was iterative and was last updated in August 2026 to capture the most current available scholarship.

Inclusion and exclusion criteria

To enhance methodological rigor and minimize selection bias, explicit inclusion and exclusion criteria were established before conducting the literature search. Predetermining these criteria is a fundamental component of evidence synthesis because it promotes transparency, consistency, and replicability, while reducing the likelihood that researchers will consciously or unconsciously select studies that support preconceived assumptions (Aromataris & Munn, 2020; Booth et al., 2022; Snyder, 2019). Establishing selection criteria a priori also serves as a safeguard against confirmation bias by ensuring that all potentially relevant evidence is evaluated using the same standards regardless of whether findings support or contradict anticipated conclusions (Grant & Booth, 2009).

This review included peer-reviewed journal articles, scholarly books, government reports, and publications from reputable professional and international organizations that addressed one or more of the following domains: (a) artificial intelligence and labor market transformation, (b) educational and career decision-making among international students, (c) employability and workforce transitions in STEM and healthcare professions, (d) workforce development and AI literacy, and (e) immigration policies influencing post-graduation employment opportunities for international students. Government and professional organization reports were included when they provided empirical labor market projections, workforce statistics, immigration policy analyses, or educational trend data produced by recognized national or international agencies. Sources representing diverse methodological approaches and differing perspectives regarding the opportunities and challenges associated with artificial intelligence were intentionally included to support a balanced and comprehensive analysis.

Studies were excluded if they focused exclusively on primary or secondary education, addressed artificial intelligence without implications for higher education or workforce outcomes, examined domestic student populations without relevance to internationally mobile students, or lacked sufficient methodological transparency. Editorials, opinion pieces, commercial publications, promotional materials, and non-scholarly sources that did not provide empirical evidence or substantive theoretical contribution were excluded unless they represented official policy statements or workforce reports issued by recognized governmental or international organizations. Duplicate publications and studies with insufficient relevance to the study's conceptual framework were also excluded. To improve the transparency of the review, approximately 246 records were initially identified across databases and snowball searches, of which approximately 203 remained after removing duplicates and screening titles and abstracts for relevance; approximately 137 full-text sources were assessed against the inclusion and exclusion criteria above, and 95 sources were retained for thematic synthesis and are represented in the reference list.

Screening, thematic analysis, and quality appraisal

Titles and abstracts were screened for relevance to the study objectives, and full-text articles meeting the inclusion criteria were retained for synthesis. Because this review draws on evidence from multiple disciplinary traditions—including economics of education, migration studies, human-computer interaction,

and workforce policy—methodological rigor was assessed through consideration of publication quality, theoretical relevance, methodological transparency, and consistency with contemporary scholarship, with particular attention to the credibility of recent publications given the rapidly expanding literature on artificial intelligence and workforce transformation. No formal, standardized quality-appraisal checklist (e.g., PRISMA, MMAT, or a discipline-specific critical appraisal tool) was applied, consistent with common practice in integrative reviews spanning heterogeneous methodological traditions (Snyder, 2019; Torracco, 2016); instead, each source was appraised narratively by both authors according to the criteria above, and sources on which the authors disagreed were discussed until consensus was reached. This narrative approach is noted as a limitation below.

To further minimize unconscious selection bias, evidence both supporting and challenging prevailing perspectives regarding artificial intelligence, employability, labor market transformation, and immigration-related opportunities was considered throughout the review process. The inclusion of peer-reviewed scholarship alongside governmental, international, and professional workforce reports provided methodological triangulation intended to strengthen the comprehensiveness and credibility of the findings.

A thematic analysis approach was used to identify recurring patterns, relationships, and emerging themes across the retained literature. The analysis focused on three primary domains: (a) AI-driven transformations in educational and career decision-making, (b) employability resilience within STEM and healthcare professions, and (c) workforce mobility and immigration policy implications for international students. Themes were iteratively refined through comparative analysis of findings across studies, allowing for the identification of convergent trends and policy-relevant insights.

Limitations of the integrative review approach

Several limitations inherent to integrative literature review methodologies should be acknowledged at the outset. Unlike meta-analytic approaches, integrative reviews do not statistically synthesize empirical findings; consequently, conclusions remain dependent on the methodological quality, scope, and theoretical perspectives represented within existing scholarship. Because artificial intelligence continues to evolve rapidly, labor market projections and technological trends discussed here remain subject to change. Finally, although integrative reviews facilitate interdisciplinary synthesis, they necessarily involve interpretive decisions regarding study inclusion and thematic organization; the systematic search procedures, explicit inclusion and exclusion criteria, and a priori thematic categories described above were intended to enhance methodological transparency and minimize unconscious selection bias. Relatedly, because no standardized quality-appraisal checklist was applied, the narrative appraisal process described above, while conducted independently by both authors, remains more susceptible to subjectivity than a structured tool-based approach.

RESULTS

AI-driven educational and career decision-making

The review revealed substantial shifts in educational preferences and career planning associated with the increasing integration of AI across labor markets. One prominent finding was growing demand for STEM-related education: as organizations increasingly adopt AI technologies, students are demonstrating heightened interest in disciplines associated with data analytics, computer science, engineering, and information systems. However, the literature also indicates that this growth has been accompanied by persistent disparities in participation, particularly among women in certain engineering and technology fields (Al Aina, 2026; Al-Motrif et al., 2025; Awu et al., 2025; Bound et al., 2021; Eide & Showalter, 2010; Hanson & Slaughter, 2017; Oh, 2025).

Healthcare education emerged as another area of significant expansion. Increasing healthcare complexity, demographic change, and perceptions of long-term occupational stability have contributed to rising enrollment interest in medical and health-related professions. Healthcare pathways are widely viewed in the reviewed literature as offering greater resilience against automation because of the continued

necessity of human judgment, interpersonal communication, and patient-centered care (Al Aina, 2026; Awu et al., 2025; Emerson et al., 2026).

A recurring concern across the study was the lag between technological innovation and curricular adaptation within higher education. Many institutions have been slow to integrate occupation-specific AI competencies into existing curricula, producing a mismatch between workforce demands and graduate preparedness. Consequently, students increasingly rely on self-directed learning, online certifications, and external professional development opportunities to acquire AI-related knowledge and digital competencies necessary for career advancement (Al Aina, 2026; Yaprak et al., 2025).

Career development and AI literacy

The findings point to a significant transformation in workforce skill requirements. Traditional entry-level tasks involving routine information gathering, data processing, and content generation are increasingly automated through AI technologies. As a result, employability is becoming more closely linked to the development of transdisciplinary competencies that integrate technical AI literacy with domain-specific expertise, critical thinking, creativity, and problem-solving ability (Ninghardjanti et al., 2025).

The literature further suggests that AI functions primarily as a complementary technology rather than a complete substitute for human labor in many professional settings. Although some organizations have reduced hiring for entry-level positions, particularly in administrative and knowledge-based occupations, AI has largely been adopted as a tool to enhance productivity and support decision-making. This augmentation model enables professionals to devote greater attention to complex analytical activities, strategic planning, and human-centered interactions (Awu et al., 2025; Oh, 2025).

Another notable trend is the growing emphasis on uniquely human capabilities. Concerns regarding automation and job displacement have encouraged many younger professionals to pursue careers emphasizing interpersonal communication, empathy, collaboration, and practical expertise. Occupations requiring high levels of emotional intelligence and direct human engagement appear less susceptible to displacement and are increasingly perceived as sustainable long-term career pathways.

Workforce mobility and immigration considerations

For international students, workforce transitions remain closely linked to immigration policies governing post-graduation employment. The literature consistently identifies Optional Practical Training (OPT) and the STEM OPT extension as critical mechanisms facilitating the transition from higher education to professional employment within the United States. Graduates in fields such as data science, artificial intelligence, intelligent systems, and healthcare administration demonstrate particularly strong prospects for employer sponsorship and long-term career stability (Awu et al., 2025; Bound et al., 2021; Eide & Showalter, 2010; Oh, 2025).

The findings also emphasize the growing importance of global mobility and cross-cultural competencies. Students who engage with multiple international innovation ecosystems develop digital, cultural, and professional fluencies that are increasingly sought by multinational employers operating within globally interconnected markets.

AI and the reconfiguration of global labor markets

Automation and occupational transformation

AI is reshaping labor markets by shifting the value of human work toward higher-order cognitive functions, including analytical reasoning, creativity, strategic thinking, and complex problem-solving (Cazzaniga et al., 2024; Murray, 2025). While previous waves of automation primarily affected routine manual occupations, contemporary AI systems increasingly influence professional and knowledge-based roles, including financial analysis, accounting, legal support, and administrative functions (Engberg et al., 2025). The literature indicates that younger workers and recent graduates may be particularly vulnerable to these changes: early-career employees in occupations with high AI exposure have experienced measurable

employment declines, reflecting employers' growing reliance on automated technologies for tasks traditionally assigned to entry-level personnel (Chandar, 2025; Emerson et al., 2026; Murray, 2025; VanDerziel & Gatta, 2026; Zhang et al., 2025).

AI is also contributing to the reconfiguration of global labor markets by altering the geographic distribution of work and intensifying competition across national boundaries (Gjini & Gjini, 2026). Advances in machine learning, natural language processing, and digital collaboration platforms enable organizations to automate tasks previously outsourced to lower-cost labor markets or to distribute work more efficiently across global teams. As a result, countries that have traditionally relied on labor-intensive service sectors, such as customer support and routine professional services, may now face new economic challenges as AI substitutes for portions of these activities (Doubková & Magdin, 2026; Engberg et al., 2025). At the same time, demand is increasing for highly skilled workers capable of developing, managing, and integrating AI technologies, creating opportunities for nations with strong educational systems and advanced technological infrastructure. This transformation appears to be contributing to greater labor market polarization, with growth concentrated in high-skill, high-wage occupations and in certain low-skill service jobs that remain difficult to automate, while many middle-skill occupations experience declining demand (Cazzaniga et al., 2024). Consequently, governments, educational institutions, and employers face increasing pressure to invest in workforce development, lifelong learning initiatives, and digital skill acquisition to help workers adapt to the evolving global economy (Doubková & Magdin, 2026; Murray, 2025; Zhang et al., 2025).

STEM and healthcare as comparatively resilient career pathways

Among the educational pathways examined, STEM and healthcare professions emerged in the reviewed literature as comparatively resilient to AI-related disruption, rather than as universally superior choices. Demand for AI specialists, data scientists, cybersecurity professionals, and software developers continues to expand, driven by widespread organizational adoption of advanced technologies and digital transformation initiatives; software developer roles, for example, are projected to grow by 17.9% through 2033 (Kawamoto, 2026; Semi et al., 2026; U.S. Bureau of Labor Statistics [BLS], 2025b; Yelne et al., 2023).

Similarly, healthcare occupations demonstrate strong resistance to automation because of their reliance on human interaction, ethical judgment, and individualized patient care. AI applications in healthcare primarily serve augmentative functions—supporting diagnostics, administrative processes, and clinical decision-making—rather than replacing healthcare professionals. Nurse practitioner roles, for instance, are projected to grow by 52% by 2033, reflecting sustained demand for human-centered care that current AI systems cannot replicate (Kawamoto, 2026; Mehta et al., 2025; U.S. Bureau of Labor Statistics [BLS], 2025a).

From an immigration perspective, STEM graduates benefit from significant policy advantages in the United States, including eligibility for the 24-month STEM Optional Practical Training (OPT) extension, which provides additional time to gain professional experience and pursue employer-sponsored H-1B visas. Consequently, STEM and nursing graduates appear to have comparatively clearer pathways to transition into the U.S. workforce following graduation. Moreover, more than 80% of internationally trained AI doctoral graduates remain in the United States after completing their degrees, illustrating the strong retention of highly skilled international talent within technology fields and underscoring the strategic importance of these disciplines to national workforce development (Awu et al., 2025; Bound et al., 2021; Eide & Showalter, 2010; Oh, 2025; Wang, 2026).

AI in recruitment, professional advancement, and strategic pathways for career sustainability

The review identified a growing reliance on AI-powered recruitment technologies, including Applicant Tracking Systems (ATS) and predictive hiring algorithms. These systems have become central to contemporary hiring processes, increasing efficiency while simultaneously introducing potential barriers for international applicants. Linguistic differences, cultural variation in résumé construction, and

nontraditional educational pathways may inadvertently disadvantage some candidates during automated screening (Bogen & Rieke, 2018; Li & Whalen, 2021).

At the same time, international students are increasingly using generative AI technologies to strengthen their competitiveness in the labor market. AI-assisted tools are commonly used for résumé optimization, interview preparation, professional communication, and career planning, helping candidates navigate increasingly digital recruitment environments (Aydin et al., 2026).

Across the literature, two educational and professional domains consistently emerged as offering comparatively strong protection against AI-driven workforce disruption: healthcare professions and data-centric STEM disciplines. Healthcare careers benefit from durable demand associated with aging populations, expanding healthcare needs, and the difficulty of automating human-centered care. Careers focused on data science, artificial intelligence, bioinformatics, engineering, and machine learning remain sought after because they involve designing, managing, governing, and optimizing the technologies driving workforce transformation. Individuals who combine advanced technical expertise with domain-specific knowledge therefore appear well positioned to maintain labor market competitiveness in an increasingly AI-integrated economy.

Note on the strength of evidence

Because this integrative review draws on labor-market projections, empirical studies, adjacent literatures, and the authors' own theoretical synthesis, it is useful to distinguish the type of support underlying the review's central claims rather than presenting all findings with uniform confidence. Claims regarding sustained labor-market demand in STEM and healthcare occupations rest on direct empirical and projective evidence (e.g., BLS and WEF workforce projections), but that evidence alone does not establish the long-term career sustainability of international graduates specifically, which also depends on immigration policy, institutional support, and individual circumstances not directly measured here. Similarly, literature on algorithmic bias in recruitment documents plausible mechanisms of disadvantage for candidates with nondominant linguistic or educational backgrounds in general; because this literature was not conducted on international-student populations specifically, its application to international students in this review represents a conceptual extension of adjacent findings rather than direct evidence. Readers should therefore weigh the review's conclusions about STEM and healthcare career sustainability as a synthesis of current labor-market and immigration conditions rather than as a permanent or discipline-specific hierarchy of educational value.

Figure 1. *Integrated social cognitive career theory and human capital theory model of career sustainability in the age of artificial intelligence*

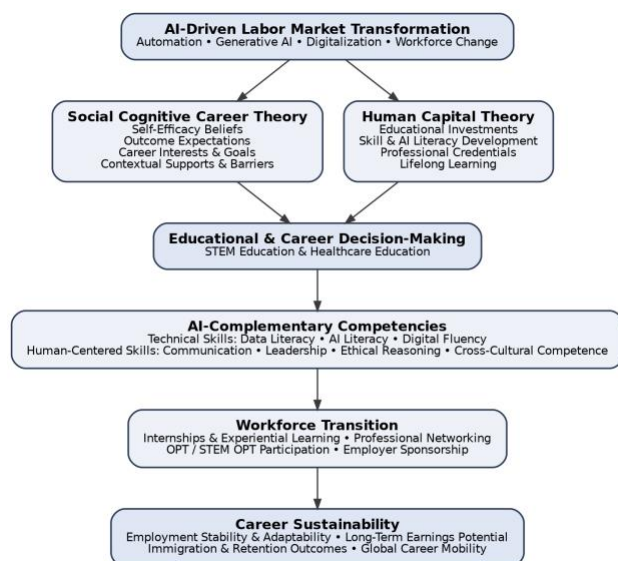


Figure 1 illustrates the influence of artificial intelligence (AI) on international students' educational and career development pathways. Social Cognitive Career Theory (SCCT) explains how self-efficacy beliefs, outcome expectations, career interests, and contextual influences shape educational decision-making, while Human Capital Theory (HCT) explains how educational investments and skill acquisition enhance employability and labor market value. Together, these pathways influence students' selection of STEM and healthcare education, facilitate the development of AI-complementary competencies, and ultimately contribute to workforce transition success and long-term career sustainability.

DISCUSSION

This integrative review examined how artificial intelligence is influencing international students' educational decision-making, career development, workforce preparedness, and long-term career sustainability. The findings suggest that AI is not simply transforming labor markets but is also reshaping how students evaluate educational investments, professional opportunities, and future migration pathways. Across the reviewed literature, STEM and healthcare disciplines consistently emerged as comparatively resilient educational pathways in response to AI-driven workforce transformation, owing to strong labor market demand, relative complementarity with automation, and favorable immigration opportunities—though, as noted above, this resilience should be read as a feature of current labor-market and immigration conditions rather than an inherent or permanent hierarchy among disciplines.

The findings support key propositions of Social Cognitive Career Theory (Lent et al., 1994, 2000) by demonstrating that educational and career choices are strongly influenced by self-efficacy beliefs, outcome expectations, and contextual factors. International students increasingly perceive STEM and healthcare careers as offering stronger employment prospects, higher job security, and more favorable immigration outcomes than many alternative fields. These perceptions shape outcome expectations and contribute to the formation of career interests and educational goals; students who believe they can successfully navigate technologically advanced workplaces appear more likely to pursue AI-related competencies, engage in experiential learning, and seek careers in technology-intensive sectors.

The findings also extend Human Capital Theory (Becker, 1993; Schultz, 1961) by illustrating how international students strategically invest in educational pathways that maximize both economic and immigration-related returns. Educational choices increasingly function as investments in both human capital and immigration capital: STEM and healthcare credentials provide not only occupational advantages but also increased access to work authorization opportunities such as OPT, STEM OPT extensions, and employer-sponsored visas. Educational decision-making among international students therefore reflects a broader assessment of future employability, professional mobility, and long-term career sustainability.

A particularly notable finding concerns the changing nature of employability in AI-driven economies. Historically, employability has been associated primarily with disciplinary expertise and educational attainment. The reviewed literature suggests, however, that employability increasingly depends on the integration of technical competencies with human-centered capabilities. While AI can automate routine cognitive and administrative tasks, skills such as creativity, ethical reasoning, empathy, communication, leadership, adaptability, and cross-cultural collaboration remain difficult to replicate through technological systems (World Economic Forum [WEF], 2025). This finding aligns with workforce research suggesting that future labor markets will increasingly reward individuals capable of collaborating effectively with AI rather than competing against it (Emerson et al., 2026; Georgieva, 2026).

Consistent with the Results reported above, healthcare occupies a distinctive position within the future workforce: because the profession continues to rely heavily on interpersonal communication, ethical judgment, and patient-centered care, AI functions primarily as an augmentative rather than a replacing technology in this domain (Faiyazuddin et al., 2025; Sezgin, 2023), making healthcare one of the clearer examples of technological innovation complementing rather than displacing human labor.

Similarly, STEM occupations continue to benefit from sustained growth driven by expanding demand for professionals capable of designing, implementing, governing, and improving AI systems. The increasing need for expertise in data science, cybersecurity, software development, machine learning,

bioinformatics, and intelligent systems suggests that demand for highly skilled technical workers will likely remain strong over the coming decade (U.S. Bureau of Labor Statistics, 2025a; WEF, 2025), reinforcing prior research indicating that technological disruption often creates new categories of employment even as it transforms existing occupations (Brynjolfsson & McAfee, 2017).

Despite these opportunities, the findings also reveal challenges that may disproportionately affect international students. One significant concern involves unequal access to AI literacy and digital resources. Students from developing nations or under-resourced educational systems may enter higher education with lower levels of technological preparedness, limiting their ability to compete effectively in AI-intensive labor markets. This emerging digital divide extends beyond access to technology itself and includes disparities in digital fluency, data literacy, and opportunities for experiential learning; without intentional institutional interventions, AI-driven labor markets risk exacerbating existing educational and socioeconomic inequalities.

Another concern involves the growing use of AI-powered recruitment systems. Applicant Tracking Systems, predictive hiring algorithms, and automated candidate screening technologies have become commonplace across many industries. While these systems can improve organizational efficiency, they may inadvertently disadvantage international students whose educational backgrounds, linguistic patterns, or cultural communication styles differ from those represented in algorithmic training data (Bogen & Rieke, 2018; Li & Whalen, 2021). As noted above, this literature documents plausible mechanisms of disadvantage rather than direct evidence specific to international-student populations, but the concerns it raises regarding equity, transparency, and fairness in AI-mediated hiring remain important for this population.

The review additionally highlights ongoing tension between labor market needs and immigration policy. Although international graduates contribute substantially to innovation, research productivity, and workforce development within the United States, many continue to encounter significant barriers during the transition from education to employment. Visa limitations, H-1B lottery uncertainty, and lengthy permanent-residency waiting periods may discourage highly skilled graduates from remaining in the United States despite strong labor market demand—a challenge made more consequential by global competition for STEM and healthcare talent, as countries such as Canada, Australia, and the United Kingdom have implemented immigration policies specifically designed to attract and retain highly skilled international graduates (She & Wotherspoon, 2013). The capacity of the United States to remain globally competitive may increasingly depend on its ability to retain international talent educated within its own higher education system.

Taken together, artificial intelligence is transforming the relationship between education, employment, and career sustainability. For international students, educational decision-making increasingly involves balancing personal interests with labor market demand, technological disruption, and immigration opportunity. Guided by SCCT and HCT, the findings suggest that STEM and healthcare pathways currently offer a comparatively strong combination of employability, workforce resilience, and long-term career sustainability. However, the future workforce will likely reward more than technical expertise alone: success in AI-driven economies will require individuals who can integrate technological fluency with creativity, ethical reasoning, communication, adaptability, and human-centered leadership. Universities, employers, and policymakers share responsibility for building educational and workforce systems that support these competencies while ensuring equitable access to opportunity. For educational leaders specifically, this responsibility translates into concrete governance decisions—curricular approval, resource allocation across career services and international student offices, and cross-unit coordination—that determine whether an institution's response to AI-driven labor-market change is coherent or fragmented.

Conceptual and theoretical framework integration

Figure 1 presents an integrative conceptual model synthesizing the findings of this review. The model illustrates how AI-driven labor market transformation functions as a contextual force influencing international students' educational and career decision-making. Drawing on Social Cognitive Career Theory (Lent et al., 1994, 2000), the model proposes that labor market conditions, immigration policies,

institutional support, and AI-enabled recruitment systems influence students' self-efficacy beliefs and outcome expectations, which subsequently shape educational choices—particularly the selection of STEM and healthcare pathways perceived as offering stronger labor market returns and career stability.

The model further incorporates Human Capital Theory by demonstrating how educational choices contribute to the development of technical and human-centered competencies that enhance employability and workforce adaptability. These competencies facilitate successful workforce transitions through internships, professional networking, and employment opportunities, ultimately contributing to long-term career sustainability. The framework thus positions career sustainability as emerging from the interaction of psychological career-development mechanisms and strategic human capital investments, extending both theories by positioning AI as a central contextual factor influencing educational choices, workforce transitions, and long-term career outcomes among international students.

Theoretical contributions

This review contributes to the growing literature examining the intersection of artificial intelligence, career development, higher education, and international student mobility by extending both SCCT and HCT into the context of AI-driven workforce transformation. Although both frameworks have been widely used to explain educational and career decision-making, relatively little scholarship has examined how technological disruption shapes the relationship between career development processes, educational investments, and labor market outcomes among international students.

First, the findings expand SCCT by demonstrating that artificial intelligence functions as a significant contextual influence affecting self-efficacy beliefs, outcome expectations, and career goals. Lent et al. (1994, 2000) proposed that career-related decisions are shaped by the interaction between personal beliefs and environmental conditions; the present review suggests that AI has emerged as a major environmental factor influencing how international students evaluate educational pathways and future career opportunities, as students increasingly weigh automation risk, technological change, labor market demand, and immigration opportunity when forming educational aspirations and occupational goals.

Second, this review extends Human Capital Theory by illustrating how educational investments increasingly serve dual purposes for international students. Traditional applications of HCT emphasize the economic returns associated with education, training, and skill acquisition (Becker, 1993; Schultz, 1961); the present findings suggest that educational credentials function not only as human capital but also as immigration capital. Degrees in STEM and healthcare fields enhance employability while increasing access to immigration pathways, including STEM OPT, employer sponsorship, and workforce integration—suggesting that educational decision-making among international students may be understood as a multidimensional investment strategy involving economic, professional, and immigration-related returns.

Third, the review contributes to emerging scholarship on career sustainability by identifying AI-complementary competencies as a critical component of future employability. Existing career development theories have traditionally emphasized technical competence and occupational fit; the present findings suggest that sustainable career success increasingly depends on a combination of technical expertise and distinctly human capabilities, including adaptability, ethical reasoning, creativity, emotional intelligence, leadership, and cross-cultural competence. This finding supports recent calls for more holistic approaches to career development that recognize the dynamic interaction between technological change and human capability.

Finally, this review contributes to international student research by integrating workforce development, career theory, and migration scholarship into a unified conceptual framework. Much of the existing literature examines international student experiences through separate lenses of academic adjustment, employability, immigration policy, or labor market outcomes. The present review suggests that these domains are increasingly interconnected in AI-driven economies, and that future theoretical models may benefit from explicitly incorporating technological disruption as a contextual factor influencing educational choices, career development processes, and post-graduation mobility decisions among internationally mobile students.

Implications

Implications for higher education institutions

The findings suggest that higher education institutions must reconsider traditional approaches to workforce preparation, and that this reconsideration is fundamentally a leadership and governance challenge as much as a curricular one. University presidents, provosts, deans, academic program administrators, curriculum leaders, career-service professionals, and international student and scholar services offices each hold distinct levers for responding to AI-driven labor-market change, and coordinated institutional leadership across these roles—rather than isolated departmental action—is likely necessary to translate the recommendations below into practice. First, AI literacy should become a foundational component of undergraduate and graduate education across disciplines rather than remaining confined to computer science and engineering programs, as students entering virtually all professions will be expected to understand AI technologies, evaluate algorithmic outputs, and collaborate effectively with intelligent systems.

Second, institutions should place greater emphasis on interdisciplinary learning experiences that integrate technical and human-centered competencies. Employers increasingly seek graduates who possess both technological expertise and interpersonal capabilities; curricula that combine AI literacy with ethics, communication, leadership, problem-solving, and intercultural competence may better prepare students for future workforce demands.

Third, career services offices must modernize their support structures to address AI-driven recruitment environments. This includes educating students about ATS systems, AI-assisted résumé optimization, digital professional branding, and AI-enhanced interview preparation, alongside prioritizing internships, experiential learning opportunities, and industry partnerships that allow students to develop practical competencies and professional networks before graduation. Enacting these three priorities depends on educational leaders—deans and program chairs who approve curricular change, career-service directors who allocate advising resources, and international student office leadership who shape institutional policy toward this population—treating AI-driven workforce readiness as a shared strategic priority rather than the responsibility of a single office.

Implications for policymakers

The findings have important implications for policymakers responsible for workforce development, higher education, and immigration policy. Investments in STEM and healthcare education represent investments in national competitiveness and innovation capacity; governments should therefore prioritize policies that expand access to high-quality technical education while promoting equitable access to AI literacy resources.

Immigration policy reform may also be necessary to align talent retention strategies with workforce demands. Given persistent shortages in healthcare, technology, engineering, and data science occupations, policymakers may consider expanding pathways that facilitate the transition of highly skilled international graduates into the workforce, including modernization of employment-based visa systems, expansion of STEM-related work authorization opportunities, and clearer pathways from student status to permanent residency.

Implications for international students

For international students, the findings underscore the importance of adopting a proactive and adaptive approach to career development. Academic credentials alone are increasingly insufficient to ensure workforce success; students must actively pursue opportunities to develop AI literacy, gain practical experience, and cultivate transferable competencies that complement technological innovation.

The findings further suggest that students should focus on developing what may be described as AI-complementary skills, including critical thinking, ethical judgment, creativity, communication, leadership,

and emotional intelligence. These competencies are likely to remain valuable regardless of future technological advancement because they address dimensions of work that are difficult to automate.

Practical recommendations for international student services and career centers

The findings of this review suggest that international student services professionals and university career centers must adapt their practices to address the realities of AI-transformed labor markets. Traditional approaches focused primarily on résumé development, interview preparation, and job search strategies may no longer be sufficient to support students entering increasingly automated and technology-intensive employment environments.

First, institutions should integrate AI literacy into career readiness programming, providing international students with a foundational understanding of artificial intelligence, automation, algorithmic decision-making, and emerging workforce trends. Career preparation workshops should include instruction on how AI technologies are used in contemporary workplaces, how recruitment algorithms evaluate applications, and how students can strategically position themselves within technology-driven hiring processes.

Second, career centers should expand support for experiential learning opportunities. Internships, cooperative education experiences, undergraduate research, and project-based learning remain among the strongest predictors of post-graduation employment success. Because international students often face unique barriers to securing internships and professional experience, institutions should proactively develop partnerships with employers willing to recruit and support international talent; targeted internship programs that combine technical skill development with professional networking opportunities may meaningfully improve workforce outcomes.

Third, universities should provide specialized guidance regarding AI-assisted recruitment systems. Many employers now use Applicant Tracking Systems, automated résumé screening software, and predictive hiring technologies; career advisors should educate students about these systems and provide training on résumé optimization, professional branding, LinkedIn profile development, and digital portfolio creation, with particular attention to helping international students communicate the value of multilingualism, intercultural competence, and international experience in ways recognized by both human recruiters and automated screening systems.

Fourth, international student services offices should collaborate more closely with academic departments to promote interdisciplinary skill development. Because future employability depends not only on disciplinary knowledge but also on the integration of technical and human-centered competencies, programs that combine AI literacy, communication skills, leadership development, intercultural competence, and ethical reasoning may better prepare students for future workforce demands, embedding career readiness throughout the educational experience rather than confining it to standalone programs.

Fifth, institutions should develop targeted support structures addressing immigration-related career planning. Because visa regulations, employment authorization requirements, and immigration policies substantially influence career opportunities for international students, career advisors should receive specialized training regarding OPT, STEM OPT extensions, H-1B sponsorship processes, and alternative employment pathways; providing accurate and timely information can reduce uncertainty and strengthen students' confidence in pursuing long-term career goals (Gjini, 2023; Gjini & Hernandez-Gantes, 2025).

Finally, universities should adopt a proactive approach to promoting career adaptability and lifelong learning. Given the rapid pace of technological change, career success will increasingly depend on individuals' ability to continuously acquire new knowledge and adapt to evolving workplace requirements. Career centers should therefore emphasize transferable competencies, professional resilience, and continuous skill development as central components of career readiness programming, encouraging students to view career development as an ongoing process rather than a single transition from education to employment (Gjini, 2023).

Limitations and future research

Several limitations should be acknowledged. First, this study employed an integrative literature review methodology rather than primary empirical data collection; findings are therefore dependent on the quality, scope, and methodological rigor of existing studies. Second, because AI technologies continue to evolve rapidly, workforce projections and educational trends may change over time, and some conclusions reflect current trajectories rather than definitive future outcomes.

Third, much of the existing literature focuses on the United States and other high-income nations, limiting the generalizability of findings to students from diverse geopolitical and educational contexts. Future research should investigate how AI-driven workforce transformation affects international students across different regions, immigration systems, and labor markets.

Additional empirical research is needed to examine the longitudinal effects of AI on educational decision-making and career outcomes. Future studies should explore how AI literacy influences career self-efficacy, how international students adapt to AI-mediated recruitment processes, and whether STEM and healthcare graduates experience greater long-term career resilience than graduates from other disciplines. Research examining the intersection of AI, immigration policy, and global talent mobility—along with primary empirical studies conducted directly with international-student populations navigating AI-mediated recruitment—would meaningfully extend the conceptual synthesis offered here.

CONCLUSION

Artificial intelligence is fundamentally reshaping the relationship between education, employment, and career sustainability for international students. This integrative review synthesized interdisciplinary literature to examine how AI-driven labor market transformation influences educational decision-making, workforce preparedness, and long-term career outcomes among this population. Guided by Social Cognitive Career Theory and Human Capital Theory, the findings indicate that STEM and healthcare disciplines currently represent comparatively resilient educational pathways—not because they are inherently or permanently superior to other fields, but because of their present alignment with projected labor market demand, relative complementarity with AI systems, and comparatively favorable immigration pathways such as OPT and the STEM OPT extension.

At the same time, the review's findings caution against reducing career sustainability to disciplinary choice alone. Sustainable career success in AI-driven economies will depend on the integration of technical fluency with distinctly human competencies—critical thinking, ethical reasoning, creativity, communication, adaptability, and cross-cultural collaboration—alongside equitable access to AI literacy, transparent and fair AI-mediated recruitment practices, and supportive immigration policy. Higher education institutions, employers, and policymakers each bear responsibility for building the educational and workforce systems capable of delivering on these conditions.

Future scholarship should build on this integrative synthesis with primary empirical research—particularly longitudinal and cross-national studies—examining how international students themselves experience AI-driven educational and career decision-making. As artificial intelligence assumes an increasingly central role in shaping both higher education and global labor markets, understanding these dynamics will remain essential to supporting the career sustainability of one of higher education's most academically, economically, and scientifically consequential populations.

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Ethical statement

This study is an integrative literature review that did not involve the collection of primary data from human participants and is therefore exempt from institutional ethics review.

Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this manuscript.

Author contributions

Both authors contributed to conceptualization, methodology, literature search and screening, formal analysis, and writing of the original draft and revisions.

Data availability

Data sharing is not applicable to this article, as it is an integrative literature review and no new empirical data were generated or analyzed.

AI disclosure

ChatGPT was used solely for minimal spelling and grammar corrections during the preparation of this article. No generative artificial intelligence was used for the generation of ideas, content, analysis, or interpretation of results presented in this work. All intellectual contributions remain those of the authors, who take full responsibility for the content of the publication.

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REFERENCES

- Abina, A., Temeljotov Salaj, A., Cestnik, B., Karalič, A., Ogrinc, M., Kovačič Lukman, R., & Zidanšek, A. (2024). Challenging 21st-century competencies for STEM students: Companies' vision in Slovenia and Norway in the light of global initiatives for competencies development. *Sustainability*, 16(3), Article 1295. <https://doi.org/10.3390/su16031295>
- Acemoglu, D., & Restrepo, P. (2019). Automation and new tasks: How technology displaces and reinstates labor. *Journal of Economic Perspectives*, 33(2), 3–30. <https://doi.org/10.1257/jep.33.2.3>
- Ajuzieogu, E. (2025). *Human capital investment under AI transition: Educational returns and optimal policy* [Preprint]. ResearchGate. <https://doi.org/10.13140/RG.2.2.16426.94400>
- Al Aina, R. (2026). Bridging the AI skills gap: Preparing generation Z for the evolving job market landscape through innovative educational strategies. *Industry and Higher Education*. Advance online publication.
- Al-Motrif, A., Alfayez, A. A., Almalhy, K. M., Omar, S. A., & Alruwaili, T. (2025). Academic and technical obstacles to the shift to digital education in Saudi schools: Teachers' and experts' views. *Interactive Learning Environments*, 33(9), 5142–5165. <https://doi.org/10.1080/10494820.2025.2479157>
- Althubyani, A. R. (2026). Responsible AI integration in STEM higher education: Advancing sustainable development goals. *Sustainability*, 18(8), Article 4005. <https://doi.org/10.3390/su18084005>
- Aromataris, E., & Munn, Z. (Eds.). (2020). *JBIM manual for evidence synthesis*. JBI. <https://doi.org/10.46658/JBIMES-20-01>
- Awu, E., Darius, B., & Chimele, M. P. (2025). Human capital theory: Viewing employees as organizational asset. *Management Science Research Journal*, 9(3), 370–375. www.ijeais.org/ijamsr
- Aydin, H., Halpern, C., Arphattananon, T., & Guo, Z. (2026). Can ChatGPT help international students integrate socially and academically in US and Thai universities? A multiple case study approach. *International Journal of Comparative Education and Development*, 28(1), 36–53. <https://doi.org/10.1108/IJCED-02-2025-0014>
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. W. H. Freeman.
- Becker, G. S. (1993). *Human capital: A theoretical and empirical analysis, with special reference to education* (3rd ed.). University of Chicago Press.
- Bogen, M., & Rieke, A. (2018). *Help wanted: An examination of hiring algorithms, equity, and bias*. Upturn.
- Booth, A., Sutton, A., Clowes, M., & Martyn-St James, M. (2022). *Systematic approaches to a successful literature review* (3rd ed.). SAGE Publications.
- Bound, J., Braga, B., Khanna, G., & Turner, S. (2021). The globalization of postsecondary education: The role of international students in the US higher education system. *Journal of Economic Perspectives*, 35(1), 163–184. <https://doi.org/10.1257/jep.35.1.163>
- Brown, S. D., & Lent, R. W. (1996). A social cognitive framework for career choice counseling. *The Career Development Quarterly*, 44(4), 354–366. <https://doi.org/10.1002/j.2161-0045.1996.tb00448.x>
- Brynjolfsson, E., & McAfee, A. (2014). *The second machine age: Work, progress, and prosperity in a time of brilliant technologies*. W. W. Norton & Company.
- Brynjolfsson, E., & McAfee, A. (2017). *Machine, platform, crowd: Harnessing our digital future*. W. W. Norton & Company.
- Camacho, C. S. (2025). Effect of Biden's administration on international students' choice of major and long-term career planning. *UNC Test Journal*, 38(1).
- Cazzaniga, M., Jaumotte, F., Li, L., Melina, G., Panton, A. J., Pizzinelli, C., Rockall, E. J., & Tavares, M. M. (2024). *Gen-AI: Artificial intelligence and the future of work* (IMF Staff Discussion Note 2024/001). International Monetary Fund. <https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2024/01/14/gen-ai-artificial-intelligence-and-the-future-of-work-542379>
- Chandar, B. (2025). *AI and labor markets: What we know and don't know*. Stanford Digital Economy Lab. <https://digitaleconomy.stanford.edu/news/ai-and-labor-markets-what-we-know-and-dont-know/>

- Domínguez, A., Alarcón, E., & García, M. (2020). Applying social cognitive career theory to understand students' career development and transition outcomes. *Journal of Career Development*, 47(6), 643–658.
- Domínguez, D. G., Cheng, H. L., & De La Rue, L. (2022). Career barriers and coping efficacy with international students in counseling psychology programs. *The Counseling Psychologist*, 50(6), 780–812. <https://doi.org/10.1177/00110000221097358>
- Doubková, M., & Magdin, M. (2026). The impact of AI on the labour market. *Management & Marketing*, 21, Article 2. <https://doi.org/10.1007/s44491-026-00003-y>
- Duong, C. D., Tran, V. T., & St-Jean, É. (2024). Social cognitive career theory and higher education students' entrepreneurial intention: The role of perceived educational support and perceived entrepreneurial opportunity. *Journal of Entrepreneurship, Management and Innovation*, 20(1), 86–102. <https://doi.org/10.7341/20242015>
- Eide, E. R., & Showalter, M. H. (2010). Human capital theory and applications. In D. J. Brewer & P. J. McEwan (Eds.), *Economics of education* (pp. 27–32). Academic Press.
- Emerson, G., Kropp, M., Bedard, J., Krayner, L., Romanov, V., Hsu, M., Boedo, L. S., & Mohnot, D. (2026, April 3). *AI will reshape more jobs than it replaces*. Boston Consulting Group. <https://www.bcg.com/publications/2026/ai-will-reshape-more-jobs-than-it-replaces>
- Engberg, E., Koch, M., Lodefalk, M., & Schroeder, S. (2025). Artificial intelligence, tasks, skills, and wages: Worker-level evidence from Germany. *Research Policy*, 54(8), Article 105285. <https://doi.org/10.1016/j.respol.2025.105285>
- Faiyazuddin, M., Rahman, S. J. Q., Anand, G., Siddiqui, R. K., Mehta, R., Khatib, M. N., Gaidhane, S., Zahiruddin, Q. S., Hussain, A., & Sah, R. (2025). The impact of artificial intelligence on healthcare: A comprehensive review of advancements in diagnostics, treatment, and operational efficiency. *Health Science Reports*, 8(1), Article e70312. <https://doi.org/10.1002/hsr2.70312>
- Georgieva, K. (2026, January 14). *New skills and AI are reshaping the future of work*. IMF Blog. <https://www.imf.org/en/blogs/articles/2026/01/14/new-skills-and-ai-are-reshaping-the-future-of-work>
- Gjini, T. W. (2023). *Relationship between demographic characteristics and internship participation of senior undergraduate international students* [Doctoral dissertation, University of South Florida]. ProQuest Dissertations Publishing.
- Gjini, T. W., & Gjini, A. D. (2026). Artificial intelligence, multilingualism, and career sustainability: International students' educational and career trajectories in AI-mediated recruitment. *European Journal of Education & Language Review*, 2(2), Article 2. <https://doi.org/10.20897/ejelr/19179>
- Gjini, T. W., & Hernandez-Gantes, V. M. (2025). Who gets to intern? Demographic and institutional predictors of internship participation among international students. *European Journal of Education & Language Review*, 1(1), Article 1. <https://doi.org/10.20897/ejelr/17312>
- Grant, M. J., & Booth, A. (2009). A typology of reviews: An analysis of 14 review types and associated methodologies. *Health Information & Libraries Journal*, 26(2), 91–108. <https://doi.org/10.1111/j.1471-1842.2009.00848.x>
- Hanson, G. H., & Slaughter, M. J. (2017). High-skilled immigration and the rise of STEM occupations in U.S. employment. In R. C. Feenstra & M. P. Taylor (Eds.), *Education, skills, and technical change: Implications for future U.S. GDP growth* (pp. 375–410). University of Chicago Press.
- Hazen, H. D., & Alberts, H. C. (2006). Visitors or immigrants? International students in the United States. *Population, Space and Place*, 12(3), 201–216. <https://doi.org/10.1002/psp.409>
- Institute of International Education. (2024). *Open doors report: United States hosts more than 1.1 million international students at higher education institutions, reaching all-time high*. <https://www.iie.org/news/us-hosts-more-than-1-1-million-intl-students-at-higher-education-institutions-all-time-high/>
- Institute of International Education. (2025). *2025 Open Doors report on international educational exchange*. <https://www.iie.org/publications/open-doors-2025/>

- Jafari, F., Keykha, A., Taheriankalati, A., & Taghavi Monfared, A. (2025). The role of AI in shaping medical education: Insights from an umbrella review of review studies. *Journal of Advances in Medical Education & Professionalism*, 13(4), 270–293. <https://doi.org/10.30476/jamp.2025.105625.2116>
- Jaiswal, A., Arun, C. J., & Varma, A. (2022). Rebooting employees: Upskilling for artificial intelligence in multinational corporations. *The International Journal of Human Resource Management*, 33(6), 1179–1208. <https://doi.org/10.1080/09585192.2021.1891114>
- Kaplan, A., & Haenlein, M. (2019). Siri, Siri, in my hand: Who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence. *Business Horizons*, 62(1), 15–25. <https://doi.org/10.1016/j.bushor.2018.08.004>
- Kawamoto, D. (2026). *Seven tech occupations poised for double-digit job growth by 2034*. IEEE-USA InSight. <https://insight.ieeeusa.org/articles/seven-tech-occupations-poised-for-double-digit-job-growth-by-2034/>
- Korobova, N. (2012). *A comparative study of student engagement, satisfaction, and academic success among international and American students* (Publication No. 3511608) [Doctoral dissertation, Kansas State University]. ProQuest Dissertations and Theses Global.
- Lee, Y. F., & Lee, L. S. (Eds.). (2022). *Status and trends of STEM education in highly competitive countries: Country reports and international comparison*. TVERC.
- Lent, R. W., & Brown, S. D. (2019). Social cognitive career theory at 25: Empirical status of the interest, choice, and performance models. *Journal of Vocational Behavior*, 115, Article 103316. <https://doi.org/10.1016/j.jvb.2019.06.004>
- Lent, R. W., Brown, S. D., & Hackett, G. (1994). Toward a unifying social cognitive theory of career and academic interest, choice, and performance. *Journal of Vocational Behavior*, 45(1), 79–122. <https://doi.org/10.1006/jvbe.1994.1027>
- Lent, R. W., Brown, S. D., & Hackett, G. (1996). Career development from a social cognitive perspective. In D. Brown, L. Brooks, & Associates (Eds.), *Career choice and development* (3rd ed., pp. 373–421). Jossey-Bass.
- Lent, R. W., Brown, S. D., & Hackett, G. (2000). Contextual supports and barriers to career choice: A social cognitive analysis. *Journal of Counseling Psychology*, 47(1), 36–49. <https://doi.org/10.1037/0022-0167.47.1.36>
- Lent, R. W., Brown, S. D., Nota, L., & Soresi, S. (2001). Social cognitive career theory and the prediction of interests and goals. *Journal of Vocational Behavior*, 58(3), 474–493. <https://doi.org/10.1006/jvbe.2000.1764>
- Lent, R. W., Brown, S. D., Schmidt, J., Brenner, B., Lyons, H., & Treistman, D. (2002). Relation of contextual supports and barriers to choice behavior in engineering majors: Test of alternative social cognitive models. *Journal of Counseling Psychology*, 49(4), 485–493. <https://doi.org/10.1037/0022-0167.49.4.485>
- Li, X., & Whalen, B. (2021). Artificial intelligence and international student advising: Implications for equity and inclusion. *Journal of International Students*, 11(3), 642–660.
- Lin, X., Xu, G., & Xiong, B. (2025). Artificial intelligence literacy, sustainability of digital learning and practice achievement: A study of vocational college students. *PLOS ONE*, 20(10), Article e0332175. <https://doi.org/10.1371/journal.pone.0332175>
- Lindblom-Ylänne, S., Parpala, A., & Postareff, L. (2019). What constitutes the surface approach to learning in the light of new empirical evidence? *Studies in Higher Education*, 44(12), 2183–2195. <https://doi.org/10.1080/03075079.2018.1482267>
- McKinsey & Company. (2025). *Superagency in the workplace: Empowering people to unlock AI's full potential*. <https://www.mckinsey.com/capabilities/tech-and-ai/our-insights/superagency-in-the-workplace-empowering-people-to-unlock-ais-full-potential-at-work>
- Mehta, N., Mehta, S., Rubenstein, A., & Wood, S. K. (2025). Not replaced, but reinvented: AI education pathways to prepare future physicians to lead healthcare transformation. *Perspectives on Medical Education*, 14(1), 849–859. <https://doi.org/10.5334/pme.2233>

- Moriarty, A. (2024). *Strengthening America's competitiveness and security by welcoming more immigrants with STEM skills*. FWD.us. <https://www.fwd.us/news/stem-immigrants/>
- Murray, S. (2025). *How artificial intelligence impacts the U.S. labor market*. MIT Sloan School of Management. <https://mitsloan.mit.edu/ideas-made-to-matter/how-artificial-intelligence-impacts-us-labor-market>
- Ninghardjanti, P., Umam, M. C., Subarno, A., Winarno, W., Langgi, N. R., & Widodo, J. (2025). Evaluating the impact of AI on the critical thinking skills among the higher education students by combining the TAM model and critical thinking theory. *Frontiers in Education*, 10, Article 1719625. <https://doi.org/10.3389/feduc.2025.1719625>
- Ntsanwisi, S. (2025). Defending the role of formal education in South Africa: A theoretical and argumentative perspective on reform. *Educational Considerations*, 50(3). <https://doi.org/10.4148/0146-9282.2404>
- OECD. (2022). *OECD framework for the classification of AI systems* (OECD Digital Economy Papers, No. 323). OECD Publishing. <https://doi.org/10.1787/cb6d9eca-en>
- Oh, B. (2025). STEM immigration and U.S. STEM workforce development at the intersections of race/ethnicity, gender, and immigration status. *Socius: Sociological Research for a Dynamic World*, 11. <https://doi.org/10.1177/23780231251348092>
- Organization for Economic Co-operation and Development. (2024). *OECD framework for the classification of AI systems*. OECD Publishing.
- Pham, M., Lam, B. Q., & Bui, A. T. N. (2024). Career exploration and its influence on the relationship between self-efficacy and career choice: The moderating role of social support. *Heliyon*, 10(11), Article e31808. <https://doi.org/10.1016/j.heliyon.2024.e31808>
- Polzer, J. T. (2022). The rise of people analytics and the future of organizational research. *Research in Organizational Behavior*, 42, Article 100181. <https://doi.org/10.1016/j.riob.2023.100181>
- Portocarrero Ramos, H. C., Cruz Caro, O., Sánchez Bardales, E., Quiñones Huatangari, L., Campos Trigos, J. A., Maicelo Guevara, J. L., & Chávez Santos, R. (2025). Artificial intelligence skills and their impact on the employability of university graduates. *Frontiers in Artificial Intelligence*, 8, Article 1629320. <https://doi.org/10.3389/frai.2025.1629320>
- Rabie, R., Shaaban, S., & Lewaaelhamd, I. (2026). The impact of AI integration on human capital development in the Middle East: Leveraging the predictive power of machine learning models and measuring the moderating role of employee openness to change. *Future Business Journal*, 12, Article 71. <https://doi.org/10.1186/s43093-026-00780-2>
- Russell, S., & Norvig, P. (2021). *Artificial intelligence: A modern approach* (4th ed.). Pearson.
- Schmager, S., Pappas, I. O., & Vassilakopoulou, P. (2025). Understanding human-centred AI: A review of its defining elements and a research agenda. *Behaviour & Information Technology*, 44(15), 3771–3810. <https://doi.org/10.1080/0144929X.2024.2448719>
- Schultz, T. W. (1961). Investment in human capital. *American Economic Review*, 51(1), 1–17.
- Semi, M. M. A., Das, S., Utsho, M. R., Hossain, A., Kamal, M. B., Sizan, A. A., Tasnim, A. F., Yeasmin, S., & Parvin, M. R. (2026). Artificial intelligence in public health education: A scoping review of workforce competency development. *Health Science Reports*, 9(3), Article e72066. <https://doi.org/10.1002/hsr2.72066>
- Sezgin, E. (2023). Artificial intelligence in healthcare: Complementing, not replacing, doctors and healthcare providers. *Digital Health*, 9. <https://doi.org/10.1177/20552076231186520>
- Shapiro, H., Souto-Otero, M., & Watermeyer, R. (2026). Metacognitive AI literacy: Going beyond the AI skills gap agenda. *Learning, Media and Technology*. Advance online publication. <https://doi.org/10.1080/17439884.2026.2652638>
- Sharma, M. (2024). The impact of AI on healthcare jobs: Will automation replace doctors? *American Journal of Data Mining and Knowledge Discovery*, 9(2), 32–35. <https://doi.org/10.11648/j.ajdmkd.20240902.11>

- She, Q., & Wotherspoon, T. (2013). International student mobility and highly skilled migration: A comparative study of Canada, the United States, and the United Kingdom. *SpringerPlus*, 2, Article 132. <https://doi.org/10.1186/2193-1801-2-132>
- Sheu, H.-B., & Bordon, J. J. (2017). SCCT research in the international context: Empirical evidence, future directions, and practical implications. *Journal of Career Assessment*, 25(1), 58–74. <https://doi.org/10.1177/1069072716657826>
- Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research*, 104, 333–339. <https://doi.org/10.1016/j.jbusres.2019.07.039>
- Stone, D. L., Lukaszewski, K. M., & Johnson, R. D. (2024). Will artificial intelligence radically change human resource management processes? *Organizational Dynamics*, 53(1), Article 101034. <https://doi.org/10.1016/j.orgdyn.2024.101034>
- Thapa, B. S., Karmacharya, B., & Gajurel, D. (2025). How behavioral biases shape career choices of students: A two-stage PLS-ANN approach. *Businesses*, 5(3), Article 35. <https://doi.org/10.3390/businesses5030035>
- Torraco, R. J. (2016). Writing integrative literature reviews: Using the past and present to explore the future. *Human Resource Development Review*, 15(4), 404–428. <https://doi.org/10.1177/1534484316671606>
- U.S. Bureau of Labor Statistics. (2025a). *Employment projections: 2024–2034*. U.S. Department of Labor.
- U.S. Bureau of Labor Statistics. (2025b). *Software developers, quality assurance analysts, and testers: Occupational outlook handbook*. U.S. Department of Labor. <https://www.bls.gov/ooh/computer-and-information-technology/software-developers.htm>
- United Nations Educational, Scientific and Cultural Organization. (2012). *Global education digest 2012*. UNESCO Institute for Statistics.
- United States Citizenship and Immigration Services. (2020). *I-9 central: Foreign academic students*. <https://www.uscis.gov/i-9-central/complete-correct-form-i-9/foreign-academic-students>
- VanDerziel, S., & Gatta, M. (2026). *The impact of AI on the early-career labor market*. National Association of Colleges and Employers. <https://www.nacweb.org/job-market/trends-and-predictions/the-impact-of-ai-on-the-early-career-labor-market>
- Varunki, M., Katajavuori, N., & Postareff, L. (2017). First-year students' approaches to learning and factors related to change or stability in their deep approach during a pharmacy course. *Studies in Higher Education*, 42(2), 331–353. <https://doi.org/10.1080/03075079.2015.1049140>
- Wang, D., Liu, B., Jiang, Y., Zhang, D., Duan, Y., Liang, Y., & Song, C. (2026). The impact of career social support on employability of university students from low-income families in China: The chain mediating roles of career decision-making self-efficacy and career goals. *Current Psychology*. Advance online publication. <https://doi.org/10.1007/s12144-025-08913-6>
- Wang, D., Liu, X., & Deng, H. (2022). The perspectives of social cognitive career theory approach in current times. *Frontiers in Psychology*, 13, Article 1023994. <https://doi.org/10.3389/fpsyg.2022.1023994>
- Wang, K.-H., & Lu, W.-C. (2025). Will artificial intelligence reshape the global workforce by 2025? *Business and Finance Research Journal*, 7(1). <https://journal.wiseedu.co.id/index.php/bafrjournal/article/view/178>
- Wang, V. (2026). Academic ghost models under AI scrutiny: Outdated syllabi and credential misalignment in modern institutions. *International Journal of AI in Pedagogy, Innovation, and Learning Futures*, 1(1). <https://doi.org/10.46787/ijaipil.v2026i1.6951>
- World Economic Forum. (2025). *The future of jobs report 2025*. <https://www.weforum.org/publications/the-future-of-jobs-report-2025/>
- Yao, C., & McWha-Hermann, I. (2025). Contextualizing career development: Cultural affordances as the missing link in social cognitive career theory. *Journal of Vocational Behavior*, 159, Article 104114. <https://doi.org/10.1016/j.jvb.2025.104114>

- Yaprak, B., Ercan, S., Coşan, B., & Ecevit, M. Z. (2025). Curriculum–skill gap in the AI era: Assessing alignment in communication-related programs. *Journalism and Media*, 6(4), Article 171. <https://doi.org/10.3390/journalmedia6040171>
- Yelne, S., Chaudhary, M., Dod, K., Sayyad, A., & Sharma, R. (2023). Harnessing the power of AI: A comprehensive review of its impact and challenges in nursing science and healthcare. *Cureus*, 15(11), Article e49252. <https://doi.org/10.7759/cureus.49252>
- Zárate-Torres, R., Rey-Sarmiento, C. F., Acosta-Prado, J. C., Gómez-Cruz, N. A., Rodríguez Castro, D. Y., & Camargo, J. (2025). Influence of leadership on human–artificial intelligence collaboration. *Behavioral Sciences*, 15(7), Article 873. <https://doi.org/10.3390/bs15070873>
- Zhang, Q., Liao, G., Ran, X., & Wang, F. (2025). The impact of AI usage on innovation behavior at work: The moderating role of openness and job complexity. *Behavioral Sciences*, 15(4), Article 491. <https://doi.org/10.3390/bs15040491>
- Zhao, W. X., Peng, M. Y., & Liu, F. (2021). Cross-cultural differences in adopting Social Cognitive Career Theory at student employability in PLS-SEM: The mediating roles of self-efficacy and deep approach to learning. *Frontiers in Psychology*, 12, Article 586839. <https://doi.org/10.3389/fpsyg.2021.586839>