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Review paper

Artificial Intelligence, Multilingualism, and Career Sustainability: International Students' Educational and Career Trajectories in AI-Mediated Recruitment

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ABSTRACT

Artificial intelligence (AI) is rapidly transforming educational investments, professional competencies, and career opportunities in contemporary labor markets. For international students, these transformations extend beyond employability and economic returns to encompass multilingual identities, technological adaptation, global mobility, and participation within increasingly AI-mediated recruitment systems. Guided by Social Cognitive Career Theory (SCCT), Human Capital Theory (HCT), and Bourdieu's theory of linguistic, cultural, and social capital, this integrative literature review synthesizes interdisciplinary empirical literature, workforce reports, and policy analyses to examine how language ideologies, amplified by AI-driven labor market transformation and algorithmic hiring practices, shape educational decision-making, career development, and career sustainability among international students. The findings suggest that comparatively resilient educational pathways are characterized not solely by disciplinary affiliation but by their capacity to support technological adaptation, career sustainability, and lifelong learning. STEM and healthcare disciplines emerged as comparatively resilient pathways because of projected labor market demand and opportunities for AI complementarity. The review also highlights how Applicant Tracking Systems, predictive hiring algorithms, and native-speaker language ideologies embedded within AI-mediated recruitment systems may unevenly recognize the credentials and communicative practices of multilingual candidates. International students should therefore not be conceptualized primarily as repositories of human capital but as multilingual, culturally situated learners, whose educational and career trajectories are increasingly shaped by AI-driven systems and unequal distributions of technological, social, cultural, and linguistic capital. Career sustainability ultimately depends on equitable access, linguistic legitimacy, and opportunities for lifelong learning alongside disciplinary preparation.

Keywords: artificial intelligence, multilingualism, language ideology, AI-mediated recruitment, international students, linguistic capital, career sustainability, workforce transformation

AI is rapidly transforming labor markets, higher education, and global talent mobility. Advances in automation, machine learning, generative artificial intelligence, and predictive analytics are fundamentally reshaping how individuals acquire knowledge, develop professional competencies, and navigate increasingly technology-mediated career pathways (Acemoglu & Restrepo, 2019; Brynjolfsson & McAfee, 2017; World Economic Forum [WEF], 2025). While these developments present significant opportunities for workforce innovation and economic growth,

they also raise important questions about equity, multilingualism, language ideology, and access for historically underrepresented populations in global labor markets.

Among those most significantly affected by these transformations are international students. During the 2024/25 academic year, there were approximately 1.2 million international students enrolled in U.S. higher education institutions (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). In the U.S. higher education context, they are defined as non-U.S. citizens enrolled at U.S. colleges and universities who identify as nonimmigrant visa holders, including F-1 (student), J-1 (exchange visitor), M-1 (vocational training), and certain temporary visa categories such as H visas (Gjini, 2023; Korobova, 2012; United States Citizenship and Immigration Services [USCIS], 2020). F-1 and J-1 visas are formally classified under U.S. immigration law as nonimmigrant, single-intent categories, meaning that applicants must demonstrate an intent to return to their home country upon completion of their studies or exchange program; in practice, however, this formal classification does not preclude students from later developing an intent to remain, and the degree to which single intent is enforced varies across visa category and stage of the immigration process. Illustrating this gap between formal classification and students' lived intentions, research reports an increased intent among senior international students reported to work and remain in the U.S. after graduation (Gjini, 2023; Hazen & Alberts, 2006). However, because this finding is drawn from a relatively small sample at a single institution, and because international mobility trends are constantly shifting due to socio-economic and political factors, it may not be generalized to the broader international student population. As they come to the U.S. to pursue better educational opportunities and improve their career prospects, international students experience greater socio-cultural, linguistic, economic, and vocational challenges than their U.S. domestic peers (Gjini, 2023; Gjini & Hernandez-Gantes, 2025; Hazen & Alberts, 2006).

Nevertheless, international students contribute substantially to the academic, scientific, and economic vitality of higher education institutions in the United States, while simultaneously serving as important contributors to global knowledge economies (Bound et al., 2021). Their educational experiences increasingly extend beyond traditional questions of academic success and labor market participation to encompass technological adaptation, immigration policy, transnational mobility, and participation within AI-mediated recruitment systems. Much of the existing literature conceptualizes international students primarily as future workers whose educational investments generate economic returns through improved employment outcomes and professional advancement (Altbach & de Wit, 2024). Such perspectives are frequently informed by Human Capital Theory, which characterizes investments in education, training, and skill acquisition as mechanisms for increasing productivity and labor market value (Becker, 1993; Schultz, 1961). Within this framework, multilingualism and international educational experiences are often positioned instrumentally as competitive advantages that enhance employability or facilitate immigration opportunities.

While economic perspectives undoubtedly offer important insights concerning international student mobility and workforce development, they remain insufficient for understanding the multidimensional realities of educational and career development in technologically mediated labor markets. International students are not merely repositories of human capital or participants in global talent pipelines. They are multilingual, culturally situated learners whose identities, communicative practices, and professional aspirations are increasingly negotiated within environments shaped by artificial intelligence, algorithmic decision-making processes, and evolving language ideologies. Consequently, contemporary discussions concerning international student employability must extend beyond economic returns to consider questions of identity, linguistic legitimacy, technological equity, and social inclusion (Lee & Rice, 2007; Marginson, 2014; Popadiuk & Arthur, 2014; Wiesel-Brown, 2026; Zhao, 2022). Consequently, educational and career decision-making among international students has become increasingly complex in contemporary AI-driven economies (Altbach & de Wit, 2024).

Although growing scholarship has examined the implications of artificial intelligence for workforce development and employability, recent developments in AI-mediated recruitment practices further underscore the importance of adopting more critical and multidimensional perspectives. Applicant Tracking Systems (ATS), predictive hiring algorithms, automated résumé screening technologies, and generative AI tools have become increasingly prominent components of contemporary recruitment processes across industries (Bogen & Rieke, 2018). Although such technologies offer organizational efficiencies, emerging scholarship suggests that algorithmic systems frequently reproduce existing social inequalities when their design, implementation, and training data privilege dominant linguistic, cultural, and institutional norms (Benjamin, 2019; Noble, 2018). For multilingual and internationally mobile populations, technologically mediated recruitment systems introduce additional considerations regarding language use, professional communication practices, and the recognition of diverse forms of cultural and linguistic capital.

These concerns are particularly salient for international students navigating educational systems and labor markets that frequently privilege standardized varieties of language and culturally dominant forms of professional

self-presentation. Multilingual graduates may encounter challenges communicating the value of their international experiences, linguistic repertoires, and intercultural competencies within recruitment processes increasingly mediated by automated technologies. Consequently, AI-driven labor market transformation represents not merely a technological phenomenon but also a sociocultural and linguistic one that shapes how educational investments are interpreted, valued, and rewarded (Aydin et al., 2026; Zhao, 2022).

This study therefore adopts a multidimensional approach to understanding how artificial intelligence influences educational and career decision-making among international students. Drawing upon Social Cognitive Career Theory, Human Capital Theory, and Bourdieu's conceptualization of linguistic capital, this integrative literature review examines how technological transformation, multilingual identities, immigration systems, and algorithmic hiring practices collectively influence career sustainability and post-graduation opportunities among internationally mobile students.

Unlike previous scholarship, which primarily emphasizes labor market demand or discipline-specific educational pathways, this study critically interrogates how AI-driven workforce transformation simultaneously creates opportunities and constraints for international students. Attention is devoted particularly to multilingualism, language ideology, algorithmic hiring practices, and technological inequalities that increasingly shape educational experiences and workforce participation. By integrating career development theory, international student scholarship, migration studies, and emerging literature on artificial intelligence and labor markets, this review contributes a more comprehensive understanding of career sustainability in technologically mediated and globally interconnected economies.

LITERATURE REVIEW

Artificial intelligence, international students, and workforce transformation

Artificial intelligence has emerged as one of the most consequential technological developments influencing contemporary labor markets. Current projections suggest that AI will substantially reshape occupational structures, skill requirements, and educational priorities across industries during the coming decades (Cazzaniga et al., 2024; OECD, 2024; World Economic Forum, 2025). Importantly, technological transformation should not be conceptualized exclusively as workforce displacement but rather as the reconfiguration of human labor and professional competencies. Existing scholarship increasingly suggests that the future of work will depend upon the interaction between technological capabilities and uniquely human competencies, including adaptability, creativity, ethical reasoning, intercultural communication, and lifelong learning.

For international students, these developments are particularly consequential because educational choices frequently reflect both labor market considerations and transnational mobility aspirations. Previous research demonstrates that international students often consider employability, immigration opportunities, financial returns, and career sustainability when selecting academic programs and professional pathways (Gjini, 2023). However, the rapid evolution of artificial intelligence requires expanding traditional conceptualizations of career decision-making to incorporate technological adaptation and algorithmically mediated labor markets.

Multilingualism beyond human capital

Human Capital Theory remains among the most influential frameworks for understanding educational investments and labor market participation. Becker (1993) argues that investments in education increase individuals' productivity and subsequently improve economic outcomes throughout their careers. Applied to international student mobility, Human Capital Theory suggests that international education constitutes a strategic investment designed to maximize professional opportunities and long-term economic returns.

Although Human Capital Theory provides valuable insights concerning educational decision-making, exclusively economic interpretations of international student experiences risk commodifying multilingualism and reducing educational investments to labor market transactions. Such perspectives inadequately capture the social, cultural, and linguistic dimensions of internationally mobile students' experiences.

Drawing upon Bourdieu's (1991) conceptualization of linguistic capital, multilingual competencies may be understood simultaneously as professional resources, cultural practices, and dimensions of personal identity. International students contribute substantially more than disciplinary expertise to educational institutions and labor markets. Their multilingual repertoires, intercultural competencies, and transnational experiences constitute valuable forms of social and cultural capital that enrich both academic and professional communities. Consequently, educational investments should not be conceptualized exclusively through their economic returns but rather as multidimensional processes that facilitate professional development, identity formation, and global mobility.

Language ideology and AI-mediated recruitment

An emerging body of scholarship has begun examining the implications of algorithmic decision-making systems for equity and access within contemporary labor markets. Applicant Tracking Systems, automated candidate screening technologies, and predictive hiring algorithms increasingly shape employment opportunities across occupational sectors (Bogen & Rieke, 2018). Although these technologies frequently promise objectivity and efficiency, scholars have cautioned that algorithmic systems are neither neutral nor value-free. Rather, they frequently reproduce existing social inequalities through the assumptions embedded within their design and implementation (Benjamin, 2019; Noble, 2018).

For multilingual populations, language ideology constitutes an increasingly important dimension of technologically mediated recruitment practices. Native-speaker ideologies and standardized language expectations may inadvertently privilege particular forms of professional communication while marginalizing equally legitimate multilingual practices (Flores & Rosa, 2015; Holliday, 2006; Roberts, 2013). International graduates whose professional experiences and communicative practices differ from dominant linguistic norms may therefore encounter additional barriers within algorithmically mediated hiring environments (Koenecke et al., 2020).

At the same time, the literature is not uniform on this point, and countervailing evidence warrants consideration. Some scholars note that, when carefully designed and audited, structured or algorithmic screening can reduce certain forms of human bias relative to unstructured human interviews, which are themselves susceptible to interviewer bias, halo effects, and inconsistent evaluation criteria (Bogen & Rieke, 2018; Stone et al., 2024). Algorithmic tools are therefore not inherently more biased than the human-mediated processes they replace; their effects on equity depend substantially on design choices, training data, and auditing practices. Similarly, the advantages and disadvantages associated with multilingualism do not appear uniform across labor-market sectors: multilingual competencies function as a clearer professional asset in client-facing, international, and language-services occupations, whereas their recognition is more inconsistent within technical and administrative fields where standardized, monolingual communication norms remain more deeply entrenched (Roberts, 2013; Wilczewski & Alon, 2023). This more mixed picture suggests that the relationship among AI-mediated recruitment, algorithmic bias, and multilingual disadvantage is contingent upon system design, occupational context, and implementation choices rather than uniform or inevitable.

These concerns suggest that contemporary discussions concerning international student employability should extend beyond résumé development and technical skill acquisition. Institutions must additionally prepare students to navigate technologically mediated recruitment processes while simultaneously recognizing and affirming multilingual identities as valuable dimensions of professional and academic experiences rather than competitive labor market advantages.

Career sustainability in AI-driven economies

Career sustainability has emerged as an increasingly important construct within rapidly changing labor markets. Sustainable careers are characterized not merely by successful employment outcomes but also by individuals' capacities to adapt meaningfully to changing professional environments throughout their lifetimes. Contemporary perspectives therefore emphasize adaptability, continuous learning, and the integration of technical and human-centered competencies as essential components of long-term career development.

Importantly, this review does not advance the position that STEM and healthcare disciplines represent universally superior educational pathways for international students. Rather, the reviewed literature suggests that these disciplines presently demonstrate comparatively strong indicators of career sustainability because of projected labor market demand, opportunities for AI complementarity, and comparatively favorable post-graduation employment opportunities within several immigration systems. Career resilience should therefore be conceptualized as emerging from the interaction among technological adaptation, institutional support, multilingual competencies, and equitable access to educational and professional opportunities rather than discipline-specific characteristics alone. Comparative labor-market projections illustrate the basis for this claim: software developer positions are projected to grow by 17.9% through 2033, and nurse practitioner positions by 52% over a comparable period, both well above the average projected growth rate across all U.S. occupations, reflecting sustained demand in fields where AI is understood to complement rather than replace core human judgment (Kawamoto, 2026; U.S. Bureau of Labor Statistics [BLS], 2025). These projections describe current labor-market and immigration conditions rather than a fixed or discipline-specific hierarchy of career value.

Understanding how international students make educational and career decisions within this environment requires a multidimensional theoretical perspective capable of accounting for psychological, economic, and sociocultural influences simultaneously. 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 comprehensive lens for analyzing the factors influencing international students' educational decisions and workforce preparedness in an era of rapid technological change.

Despite growing scholarly attention to each of these areas individually, a clear gap remains at their intersection. Existing literature has generally examined artificial intelligence and labor market transformation, international student employment and mobility, multilingualism and language ideology, and algorithmic recruitment as largely separate lines of inquiry, each situated within its own disciplinary literature (e.g., economics of education, migration studies, sociolinguistics, and human-computer interaction). Comparatively little scholarship has examined how these factors jointly and interactively shape the career sustainability of international students specifically, or has integrated psychological, economic, and sociological theoretical perspectives to account for this intersection. This review addresses that gap by synthesizing across these separate literatures to examine how AI-driven labor market transformation, multilingualism, and language ideology jointly shape international students' educational and career trajectories.

The purpose of this integrative review is to synthesize current literature examining how AI-driven labor market transformation, language ideologies, and AI-mediated recruitment practices shape educational and career decision-making among international students. Specifically, this study examines how multilingualism, identity, and unequal distributions of technological and social capital intersect with academic decision-making, employability, workforce transitions, and career sustainability, while also documenting which educational pathways emerged within the reviewed literature as comparatively resilient to AI-driven disruption. By integrating career development theory, Bourdieu's theory of capital, workforce research, and higher education scholarship, this review provides evidence-based recommendations for students, higher education institutions, and policymakers seeking to support equitable and sustainable career outcomes in increasingly AI-mediated economies.

THEORETICAL FRAMEWORK

This review is guided equally by three complementary theoretical perspectives: Social Cognitive Career Theory (SCCT), Human Capital Theory (HCT), and Bourdieu's theory of linguistic, cultural, and social capital. Rather than positioning Human Capital Theory as the dominant explanatory lens, this framework treats these three perspectives as co-equal foundations. SCCT contributes a psychological account of how self-efficacy beliefs and outcome expectations shape educational choices; HCT contributes an economic account of how educational investments relate to labor market returns; and Bourdieu's theory contributes a sociological account of how power, identity, and unequal access to linguistic, cultural, and social capital shape whose credentials and communicative practices are recognized as legitimate within AI-mediated labor markets. Considered together, these frameworks allow the review to examine international students not simply as strategic investors in their own human capital, but as multilingual, culturally situated learners whose trajectories are shaped by psychological, economic, and structural forces simultaneously.

Social Cognitive Career Theory (SCCT)

Developed by Lent, Brown, and Hackett (1994) and grounded in Bandura's (1986, 1997) Social Cognitive Theory, SCCT explains how individuals develop career interests and make educational and occupational decisions through the interaction of self-efficacy, outcome expectations, personal goals, and contextual influences. Self-efficacy refers to individuals' confidence in their ability to perform career-related tasks, while outcome expectations represent beliefs about the likely consequences of educational and career choices. These cognitive processes, together with environmental supports and barriers, shape career interests, decision-making, and persistence toward career goals (Lent et al., 1994, 2000).

SCCT is particularly relevant for understanding international students' educational and career trajectories because their decisions are influenced by both personal beliefs and contextual factors, including institutional support, labor market conditions, immigration policies, and cultural and linguistic barriers (Domínguez et al., 2020; Gjini, 2023; Lent & Brown, 2019). Within AI-driven labor markets, AI-mediated recruitment systems also function as contextual influences. While these technologies may facilitate career planning and skill development, algorithmic hiring practices and native-speaker language ideologies may reduce self-efficacy and create additional barriers for multilingual candidates (Duong et al., 2024; Wang et al., 2026). Consequently, SCCT provides an appropriate framework for interpreting how self-efficacy, outcome expectations, and contextual influences shape international students' educational choices, career adaptability, and workforce transitions in increasingly AI-mediated labor markets.

Human capital theory

Human Capital Theory (HCT) provides a valuable framework for understanding how international students make educational and career decisions in response to the rapid transformation of labor markets driven by AI. Originally developed by Becker (1964) 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 is viewed 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).

Although Human Capital Theory (HCT) remains one of the most influential frameworks for understanding educational investments and labor market participation, contemporary applications of the theory warrant critical consideration when examining international student experiences within increasingly AI-driven and globally interconnected labor markets. Becker (1993) conceptualized education, training, and skill acquisition as investments that enhance productivity and generate long-term economic returns. Human Capital Theory has subsequently been widely employed to explain educational choices, workforce participation, and professional advancement among internationally mobile students.

Applied to international student mobility, Human Capital Theory suggests that students pursue international education partly as a strategic investment designed to improve employability and economic returns. Previous studies have demonstrated that labor market demand, immigration opportunities, and anticipated financial outcomes frequently influence international students' educational and occupational choices (Gjini, 2023). Educational credentials therefore represent one important form of human capital that facilitates workforce participation and global mobility.

Although Human Capital Theory offers valuable explanatory power, exclusively economic interpretations of educational investments risk commodifying both education and multilingualism. Within employability discourses, multilingual competencies are frequently characterized merely as labor market advantages that improve candidates' competitiveness or facilitate access to immigration pathways. Such perspectives may inadvertently reduce multilingual identities to forms of economic utility while overlooking their broader social, cultural, and personal significance – a limitation this review addresses directly through Bourdieu's theory of capital, discussed below. Accordingly, this study adopts a critical application of Human Capital Theory that recognizes both its explanatory strengths and limitations: educational investments undoubtedly influence workforce participation and professional advancement, but they also raise questions concerning identity, linguistic legitimacy, technological equity, and global mobility that extend beyond traditional economic interpretations of human capital.

In the context of AI-driven workforce transformation, the concept of human capital has also expanded beyond traditional academic credentials. Employers increasingly seek workers who possess digital competencies, data literacy, and interdisciplinary problem-solving abilities, alongside the capacity for continuous, lifelong learning (Al Aina, 2026; WEF, 2025). Within the reviewed literature, STEM and healthcare credentials were frequently discussed as comparatively resilient forms of human capital, since occupations in data science, cybersecurity, biotechnology, and healthcare are projected to experience sustained labor market demand and, in several immigration systems, benefit from more accessible work-authorization pathways such as the STEM Optional Practical Training (OPT) extension (Bound et al., 2021; BLS, 2025; Faiyazuddin et al., 2025; WEF, 2025).

Bourdieu's theory of linguistic, cultural, and social capital

Whereas Human Capital Theory foregrounds the economic returns of education, Bourdieu's (1991) theory of capital offers a sociological account of how power, identity, and unequal access to resources shape whose competencies are recognized as legitimate within a given field. Bourdieu distinguished among several interrelated forms of capital: economic capital (material and financial resources), cultural capital (dispositions, credentials, and ways of knowing that are recognized as valuable within a given social context), social capital (access to networks and relationships that facilitate opportunity), and, specifically for multilingual populations, linguistic capital – the differential value assigned to particular languages, accents, and communicative styles within a given linguistic marketplace.

Applied to international student mobility, Bourdieu's framework suggests that multilingual competencies function simultaneously as linguistic, cultural, and social capital rather than as a mere employability asset. International students contribute more than disciplinary expertise; their multilingual abilities, intercultural competencies, and transnational experiences represent valuable forms of cultural and social capital. However, Bourdieu's concept of the linguistic marketplace also clarifies why these forms of capital are not always recognized as legitimate. Labor markets, like other social fields, tend to privilege standardized, dominant linguistic varieties and culturally normative modes of professional self-presentation. When recruitment processes – increasingly including AI-mediated systems trained predominantly on dominant-variety language data – treat these standardized forms as

neutral or default, multilingual candidates whose communicative practices differ from that norm may find their linguistic capital undervalued or unrecognized, regardless of its actual communicative or professional worth. Bourdieu's theory therefore provides this review with a vocabulary for analyzing power, identity, and access explicitly, complementing SCCT's psychological account and HCT's economic account with an explicitly sociological account of why multilingualism does not convert evenly or automatically into recognized professional value.

Human capital and structural inequalities

Although Human Capital Theory 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 the 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).

Furthermore, emerging recruitment technologies may inadvertently 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 their accumulated human capital into employment opportunities (Hanson & Slaughter, 2017; Oh, 2025).

METHODS

Research design

This study employed an Integrative Literature Review (ILR) methodology to synthesize interdisciplinary scholarship examining the relationships among artificial intelligence, international student mobility, career development, multilingualism, and workforce transformation. Integrative literature reviews are particularly appropriate when investigating emerging and multidimensional phenomena because they permit the inclusion and synthesis of theoretical, empirical, conceptual, and policy-oriented scholarship across disciplines (Aromataris & Munn, 2020; Torraco, 2016).

Given the rapidly evolving nature of artificial intelligence and its implications for higher education and global labor markets, an integrative review methodology provided an appropriate framework for examining how technological transformation influences educational decision-making, career sustainability, multilingual identities, and AI-mediated recruitment practices among international students.

Literature search strategy

A comprehensive and systematic literature search was conducted across six academic databases, namely Scopus, Web of Science, ERIC, PsycINFO, Education Source, and Google Scholar. Additional sources were identified through reference list searches and reports published by the BLS and international organizations, including UNESCO, the OECD, the International Monetary Fund, and the World Economic Forum.

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 World Economic Forum [WEF] reports and other governmental and professional organizations that monitor workforce development and technological transformation. Literature was identified through systematic searches of academic databases and publicly available policy repositories using keywords related to artificial intelligence, STEM education, healthcare professions, workforce development, employability, international students, immigration policy, and labor market transitions.

The literature search focused on publications examining one or more of the following concepts: 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"; "AI-mediated recruitment" AND multilingualism; "Applicant Tracking Systems" AND higher education; "career sustainability" AND international students; "Social Cognitive Career Theory" AND career development; "Human Capital Theory" AND international student mobility; multilingualism AND employability AND artificial intelligence; and algorithmic bias AND hiring AND international graduates.

Inclusion and exclusion criteria

Studies were included when they:

1. examined artificial intelligence, higher education, career development, workforce transformation, or international student experiences;
2. were published in peer-reviewed journals or reputable governmental and international organization reports;
3. demonstrated relevance to the study's theoretical framework and research objectives; and
4. addressed educational, technological, labor market, or immigration-related dimensions of international student experiences.

Studies were excluded when they:

1. lacked relevance to international student experiences or workforce transformation;
2. contained insufficient methodological detail;
3. were published within predatory or non-identifiable publication venues;
4. represented duplicate publications; or
5. focused exclusively upon unrelated technological phenomena.

Study selection and screening procedures

The study selection process followed PRISMA-informed screening procedures to improve methodological transparency and reduce selection bias. Titles and abstracts were initially screened for relevance to the study objectives. Full-text articles subsequently underwent independent evaluation based upon the established inclusion and exclusion criteria. Reference list searches were additionally employed to identify influential theoretical and policy-oriented publications relevant to artificial intelligence, multilingualism, career development, and labor market transformation.

Studies retained following full-text review were categorized according to their primary thematic contributions, including: (a) AI and labor market transformation; (b) international student employability; (c) multilingualism and linguistic capital; (d) career development theories; (e) AI-mediated recruitment practices; (f) higher education policy; and (g) career sustainability.

Quality appraisal procedures

Methodological rigor was assessed through consideration of publication quality, theoretical relevance, methodological transparency, and consistency with contemporary scholarship. Attention was devoted to evaluating the credibility of recent publications given the rapidly expanding literature surrounding artificial intelligence and workforce transformation.

The Integrative Literature Review (ILR) method was appropriate 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.

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 or the study's hypotheses (Aromataris & Munn, 2020; Booth et al., 2022; Snyder, 2019). Establishing study selection criteria a priori also serves as an important 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 integrative literature 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 ensure 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 contributions 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.

Consistent with these a priori criteria, evidence both supporting and challenging prevailing perspectives regarding artificial intelligence, employability, labor market transformation, and immigration-related opportunities was considered throughout the review process, and peer-reviewed scholarship was combined with governmental, international, and professional workforce reports to provide methodological triangulation.

Moreover, a thematic analysis approach was employed to identify recurring patterns, relationships, and emerging themes across related 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 integrative literature reviews

Several limitations inherent to integrative literature review methodologies should be acknowledged. Unlike meta-analytic approaches, integrative reviews do not seek statistical synthesis of empirical findings. Consequently, conclusions remain dependent upon the methodological quality, scope, and theoretical perspectives represented within existing scholarship. Furthermore, because artificial intelligence continues to evolve rapidly, labor market projections and technological trends remain subject to change over time.

Finally, although integrative reviews facilitate interdisciplinary synthesis, they necessarily involve interpretive decisions regarding study inclusion and thematic organization. Employing systematic search procedures, clearly articulated inclusion criteria, and PRISMA-informed screening processes was therefore intended to enhance methodological transparency and minimize unconscious selection bias.

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 the 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 suggests 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 experiencing significant expansion. Increasing healthcare complexity, demographic changes, and perceptions of long-term occupational stability have contributed to rising enrollment interest in medical and health-related professions. The findings indicate that healthcare pathways are widely viewed as offering greater resilience against automation due to 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 identified across studies 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, resulting in 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 underscore a significant transformation in workforce skill requirements. Traditional entry-level tasks involving routine information gathering, data processing, and content generation are increasingly being 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 abilities (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 (Aydin et al., 2026). 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 opportunities. The literature consistently identifies Optional Practical Training (OPT) and STEM OPT extensions 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 valuable digital, cultural, and professional fluencies that are increasingly sought by multinational employers operating within globally interconnected markets (Aydin et al., 2026).

Automation and Occupational Transformation

AI is fundamentally 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).

Furthermore, AI is contributing to the reconfiguration of global labor markets by altering the geographic distribution of work and intensifying competition across national boundaries. 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, data processing, and routine professional services, may face new economic challenges as AI substitutes for portions of these activities (Engberg et al., 2025; Doubková & Magdin, 2026). 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 is contributing to greater labor market polarization, with growth concentrated in high-skill, high-wage occupations and 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 ensure workers can adapt to the evolving global economy and remain competitive in an AI-driven labor market (Doubková & Magdin, 2026; Murray, 2026; Zhang et al., 2025).

STEM and healthcare as comparatively resilient pathways

Among the educational pathways examined, STEM and healthcare professions emerged within the reviewed literature as comparatively resilient pathways relative to AI-related disruption, rather than as uniquely or universally superior choices. Demand for AI specialists, data scientists, and software developers continues to expand, with software developer roles projected to grow 17.9% through 2034, while healthcare roles such as nurse practitioners are projected to grow 52% over the same period, reflecting continued reliance on human judgment and patient-centered care that AI has so far complemented rather than replaced (Kawamoto, 2026; Mehta et al., 2025; Semi et al., 2026; U.S. Bureau of Labor Statistics [BLS], 2025; Yelne et al., 2023). From an immigration perspective, STEM graduates in the United States benefit from eligibility for the 24-month STEM OPT extension, and the literature

reports that over 80% of internationally trained AI PhDs remain in the country after graduation, illustrating one channel through which comparatively resilient disciplinary pathways intersect with immigration policy (Bound et al., 2021; Oh, 2025; Wang, 2026). These patterns should be read as findings about labor market and immigration conditions at present, not as claims that STEM and healthcare are inherently superior to other disciplines.

AI-mediated recruitment, language ideology, and algorithmic bias

A central finding of this review concerns the growing role of AI-mediated recruitment systems in shaping the employability of multilingual international graduates. Applicant Tracking Systems (ATS), predictive hiring algorithms, and automated résumé-screening technologies have become standard components of contemporary hiring processes across industries (Bogen & Rieke, 2018; Stone et al., 2024). Although these systems are frequently promoted as objective and efficient, the reviewed literature indicates that they are neither neutral nor value-free: algorithmic systems trained predominantly on dominant-variety language data tend to encode native-speaker ideologies that treat standardized, majority-language communication as the default or "professional" norm (Benjamin, 2019; Bogen & Rieke, 2018; Noble, 2018).

For multilingual international graduates, this creates several distinct points of vulnerability identified across the literature. First, linguistic differences in phrasing, syntax, and idiom – even when fully grammatical and professionally appropriate – may be flagged or down-ranked by keyword-matching and natural-language-processing components of ATS platforms, on account of linguistic biases in the training data of language technologies (Koenecke et al., 2020). Second, cultural variation in résumé construction, self-presentation norms, and credential formatting may cause automated systems to misread genuinely qualified candidates as lower-fit, reproducing in automated form the gatekeeping penalties that Roberts (2013) identified among interviewees whose discursive practices diverge from institutional expectations. Third, international credentials, degrees, and professional experience obtained outside the host country are frequently inconsistently recognized by automated screening criteria calibrated to domestic educational and occupational taxonomies, compounding barriers already documented in human-mediated credential evaluation (Hanson & Slaughter, 2017; Oh, 2025). Fourth, the literature raises broader concerns about AI ethics and governance in hiring: the proprietary, largely opaque design of many commercial ATS and predictive-hiring tools limits external auditing, making it difficult for applicants, institutions, or regulators to identify or contest algorithmic bias once it occurs (Benjamin, 2019; Stone et al., 2024; White, 2026).

At the same time, the literature documents an emerging countertrend: international students are increasingly using generative AI tools themselves to prepare résumés, rehearse interviews, and refine professional communication in ways intended to align with the expectations of automated screening systems. While these strategies may improve individual competitiveness, several sources caution that they also risk placing additional adaptive burden on multilingual candidates to conform to dominant linguistic norms, rather than prompting employers and technology developers to build systems capable of recognizing diverse, legitimate forms of multilingual professional communication. Collectively, these findings suggest that career sustainability for international students depends not only on disciplinary choice but on the transparency, fairness, and linguistic inclusiveness of the AI-mediated systems through which credentials and communicative competence are evaluated.

Distinguishing types of evidence across major claims

Because this integrative review draws on empirical studies, labor-market projections, adjacent literatures, and the authors' own theoretical synthesis, it is important to distinguish which kind of support underlies each major claim rather than presenting all claims with uniform confidence. For example, labor-market projections indicating sustained demand in STEM and healthcare occupations are direct empirical or projective evidence, but they do not by themselves establish the long-term career sustainability of international graduates in those fields; that broader claim also depends on immigration policy, institutional support, and individual circumstances that were not directly measured. Similarly, research on algorithmic bias, native-speaker ideology, and linguistic gatekeeping documents plausible mechanisms of disadvantage for multilingual candidates in general, but this literature was not conducted on international-student populations specifically and does not constitute direct evidence that AI-mediated recruitment systems systematically disadvantage international students; that connection is this review's conceptual extension of adjacent findings. **Table 1** summarizes this distinction for several of the review's central claims.

Table 1

Evidence basis for major claims in this review

Major Claim	Type of Evidence	Basis / Source
STEM and healthcare occupations show comparatively	Labor-market projections	U.S. Bureau of Labor Statistics (2025); Kawamoto (2026); World Economic Forum (2025)

strong projected labor-market demand		
STEM graduates benefit from more accessible work-authorization pathways (e.g., STEM OPT)	Direct empirical / policy evidence	USCIS policy provisions; Bound et al. (2021); Oh (2025)
Algorithmic hiring systems can encode native-speaker language ideologies	Adjacent literature	Benjamin (2019); Noble (2018); Flores & Rosa (2015); Roberts (2013) — document bias mechanisms in language technology and institutional gatekeeping generally, not in international-student recruitment specifically
AI-mediated recruitment systems disadvantage international students specifically	Conceptual interpretation	Authors' theoretical extension of adjacent literatures; not directly tested on international-student populations
STEM and healthcare are comparatively resilient career pathways overall	Conceptual synthesis informed by projections	Authors' synthesis of BLS/WEF projections and immigration-policy literature; describes present conditions, not an inherent or permanent hierarchy of disciplines

DISCUSSION

Although AI presents unprecedented opportunities for workforce innovation and career development, the findings of this review suggest that AI-driven labor market transformation simultaneously creates new forms of vulnerability that may disproportionately affect international students. Existing discussions of AI and employability have largely focused on technological competencies and labor market demand while overlooking broader questions concerning language, identity, power, and access. For international students, participation in increasingly automated labor markets extends beyond acquiring technical skills and securing employment. Rather, it involves navigating complex intersections among multilingual identities, immigration systems, technological change, and algorithmically mediated hiring practices.

One of the most significant concerns identified in this review involves unequal access to AI literacy and digital resources. Students originating from developing nations or under-resourced educational systems may enter higher education with varying levels of technological preparedness and opportunities for digital skill development. Consequently, the emerging digital divide extends beyond differential access to technology itself and increasingly encompasses disparities in AI literacy, data literacy, experiential learning opportunities, and familiarity with technologically mediated professional environments (UNESCO, 2024). Without intentional institutional interventions, AI-driven labor markets risk reproducing and potentially amplifying existing educational and socioeconomic inequalities among internationally mobile students.

Equally important are the implications of AI-mediated recruitment practices for multilingual and culturally diverse populations. Applicant Tracking Systems (ATS), predictive hiring algorithms, and automated candidate screening technologies have become commonplace across contemporary recruitment processes. Although these technologies offer organizational efficiencies, growing scholarship has raised important concerns regarding algorithmic bias, transparency, and equity within automated decision-making systems (Bogen & Rieke, 2018; Noble, 2018). AI systems are not socially neutral technologies; rather, they frequently reflect the assumptions, values, and limitations embedded within their training datasets and design processes (Benjamin, 2019; Noble, 2018).

For international students, these concerns extend beyond technological literacy to encompass questions of language ideology and linguistic legitimacy. Multilingual graduates may communicate professional experiences, competencies, and accomplishments through linguistic patterns and communicative practices that differ from dominant varieties represented within algorithmic training data. Consequently, automated recruitment systems may inadvertently privilege standardized forms of professional communication and reinforce native-speaker ideologies that position linguistic repertoires as more professionally desirable than others. Such practices risk reproducing structural disadvantages for multilingual speakers whose experiences and competencies may not be easily recognized or appropriately valued by automated screening technologies (Karki et al., 2026; Wilczewski & Alon, 2022).

This perspective invites a reconsideration of multilingualism itself. Existing discussions frequently conceptualize multilingual competencies instrumentally—as additional skills that enhance employability or improve labor market outcomes. Although multilingualism undoubtedly constitutes an important labor market advantage within increasingly globalized economies, reducing multilingual identities to forms of economic capital

alone risks commodifying language and obscuring its social, cultural, and personal significance. Drawing upon Bourdieu's (1991) conceptualization of linguistic capital, multilingualism may be more appropriately understood as simultaneously constituting human, cultural, social, and linguistic capital. International students contribute more than disciplinary expertise or language proficiency; their diverse perspectives, intercultural competencies, and transnational experiences enrich educational and professional environments.

The findings additionally reveal continuing tensions among labor market needs, technological transformation, and immigration policy. International graduates contribute substantially to innovation ecosystems, scientific research, and workforce development within the United States and other knowledge-based economies (Bound et al., 2021). Nevertheless, visa restrictions, uncertainty surrounding employment sponsorship processes, and lengthy pathways toward permanent residency may discourage highly skilled graduates from remaining within host countries despite significant labor market demand. These structural barriers are particularly consequential given the global competition for highly skilled talent across science, technology, healthcare, and emerging AI-related occupations.

Importantly, STEM and healthcare should not be viewed as universally superior pathways for international students. Rather, their current career resilience reflects labor market demand, AI complementarity, and favorable employment opportunities in some immigration systems. Ultimately, career sustainability depends on the interplay of technological adaptation, institutional support, multilingual competencies, and equitable access to educational and professional opportunities. Ultimately, educational and career decision-making in AI-driven economies extends beyond maximizing economic returns or minimizing automation risks. International students increasingly negotiate questions concerning professional identity, multilingualism, technological adaptation, and global mobility within environments shaped by both human and algorithmic decision-making processes. Sustainable career success will likely depend not solely upon technical expertise but upon individuals' abilities to integrate technological fluency with ethical reasoning, intercultural competence, adaptability, communication, and lifelong learning. Consequently, the most resilient educational pathways may be those that prepare students not simply to compete within technologically mediated labor markets but to navigate them critically, ethically, and equitably.

Taken together, the findings support key propositions of Social Cognitive Career Theory by demonstrating that educational and career choices are shaped by self-efficacy beliefs, outcome expectations, and contextual factors – among which AI-mediated recruitment systems now figure prominently. The findings also extend Human Capital Theory by showing that, for many international students, educational credentials function simultaneously as human capital and as immigration capital: STEM and healthcare credentials, in particular, were associated in the reviewed literature with comparatively accessible work-authorization pathways such as OPT, STEM OPT extensions, and employer-sponsored visas. Yet the findings equally demonstrate the limits of an exclusively economic account. Bourdieu's theory of capital clarifies why employability in AI-driven economies cannot be reduced to disciplinary choice or credential accumulation alone: whether a student's linguistic, cultural, and social capital converts into recognized professional opportunity depends substantially on whether the recruitment systems they encounter – increasingly algorithmic – are designed to recognize diverse forms of legitimate professional communication.

This tension is compounded by structural barriers documented across the literature. Visa limitations, H-1B lottery uncertainty, and lengthy permanent-residency timelines may discourage highly skilled graduates from remaining in the United States despite strong labor market demand, particularly as competitor countries such as Canada, Australia, and the United Kingdom implement immigration policies designed to attract and retain international talent (She & Wotherspoon, 2013). Read alongside the review's findings on algorithmic hiring, these immigration pressures suggest that career sustainability for international students is shaped jointly by psychological factors, economic and immigration incentives, and the sociocultural legitimacy accorded to multilingual identities within both human and automated decision-making systems. Universities, employers, and policymakers therefore share responsibility for building educational and workforce systems – and, critically, more transparent and accountable AI recruitment technologies – that recognize this multidimensionality rather than reducing international students to their disciplinary or economic value alone.

Conceptual/Theoretical Framework Integration

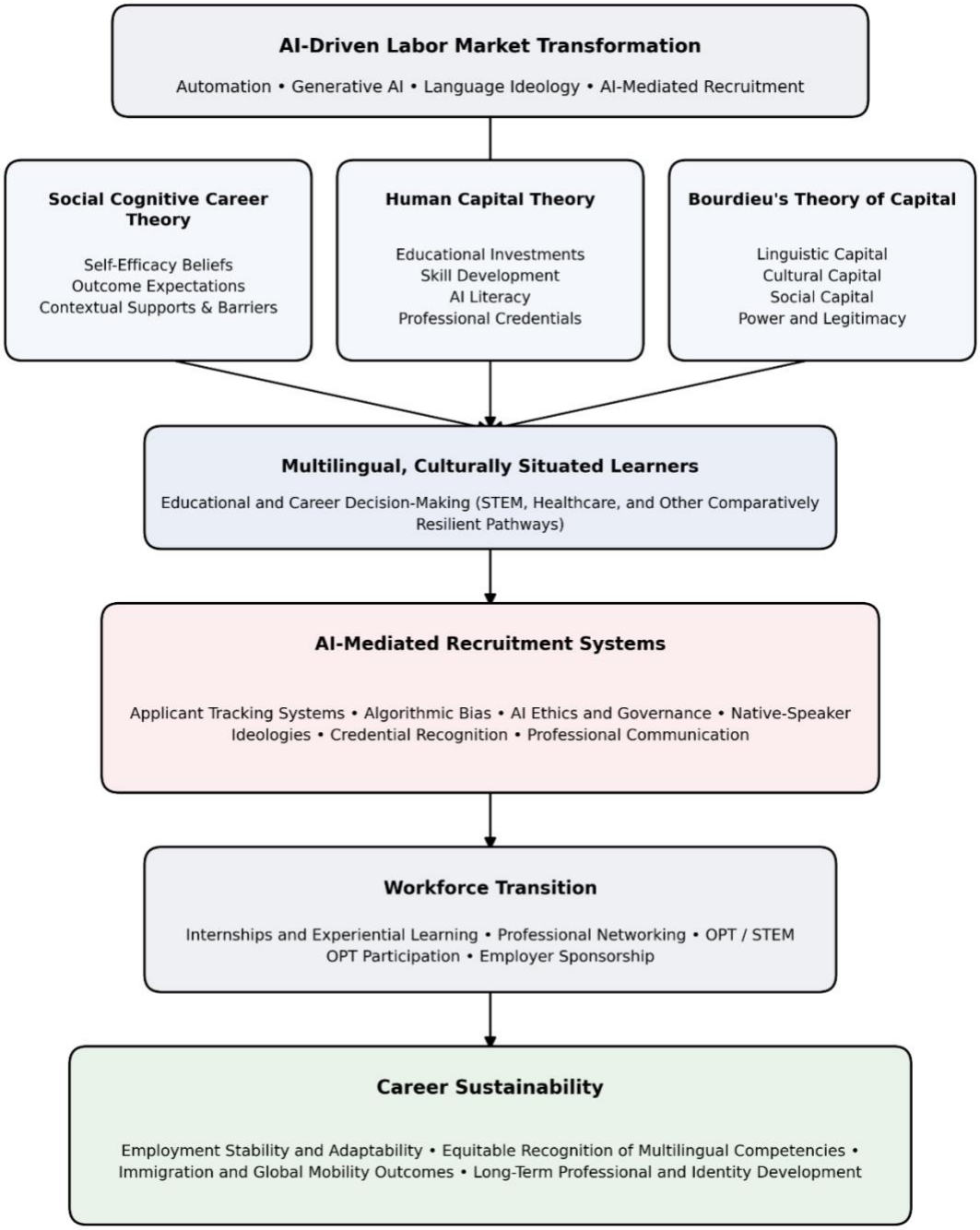
Figure 1 presents an integrative conceptual framework illustrating how AI-driven labor market transformation influences international students' educational and career decision-making through interconnected psychological, technological, institutional, linguistic, and structural mechanisms. Drawing upon Social Cognitive Career Theory (Lent et al., 1994, 2000), Human Capital Theory (Becker, 1993), and Bourdieu's (1991) conceptualization of linguistic capital, the framework conceptualizes career development as a multidimensional process situated within rapidly evolving technological and sociocultural environments.

Within this framework, artificial intelligence functions not merely as a labor market phenomenon but as a significant contextual influence shaping self-efficacy beliefs, outcome expectations, and career aspirations. Labor market conditions, immigration policies, institutional support structures, AI-mediated recruitment practices, and

language ideologies collectively influence how international students evaluate educational opportunities and future professional trajectories. These perceptions subsequently shape educational choices, career adaptability, and post-graduation mobility decisions.

Figure 1

Integrated social cognitive career theory, human capital theory, and bourdieusian model of career sustainability in the age of artificial intelligence



Importantly, the framework extends traditional applications of Human Capital Theory by critically recognizing that educational investments among international students cannot be understood exclusively through their economic returns. Educational credentials simultaneously constitute forms of human, social, cultural, and linguistic capital that influence workforce participation, professional identity formation, and transnational mobility opportunities. Consequently, multilingualism should be understood not merely as an employability advantage but as an essential dimension of international students' identities and professional experiences.

The framework further recognizes that AI-mediated hiring systems represent consequential structural mechanisms influencing educational and occupational outcomes. Applicant Tracking Systems, predictive hiring algorithms, and automated recruitment technologies may facilitate workforce participation while simultaneously reproducing existing linguistic and sociocultural inequalities when diverse communicative practices remain

insufficiently represented within algorithmic systems. The interaction among technological transformation, institutional practices, and language ideologies therefore constitutes an increasingly important contextual variable within contemporary models of career development.

Rather than positioning career sustainability as the inevitable consequence of strategic human capital investments, the proposed framework conceptualizes sustainable career development as emerging from the dynamic interaction among technological adaptation, psychological career-development processes, multilingual competencies, institutional supports, and equitable access to educational and professional opportunities. This multidimensional perspective substantially extends both Social Cognitive Career Theory and Human Capital Theory by explicitly incorporating technological disruption, multilingual identities, and algorithmic systems as central influences shaping educational and career outcomes among internationally mobile students.

Implications

The findings suggest that higher education institutions should adapt career development initiatives to reflect the realities of AI-driven labor markets. Beyond disciplinary knowledge, students require AI literacy, experiential learning opportunities, and transferable competencies such as critical thinking, communication, ethical reasoning, adaptability, and intercultural competence. Career services should also prepare students to navigate AI-mediated recruitment processes, including Applicant Tracking Systems (ATS), while helping them effectively communicate the value of multilingualism and international experience within increasingly automated hiring environments.

The findings also have implications for employers and policymakers. Employers should design recruitment systems that promote transparency, fairness, and recognition of diverse linguistic and cultural backgrounds rather than reinforcing dominant language norms through algorithmic decision-making. Policymakers, meanwhile, should align workforce development, immigration policy, and AI governance by supporting equitable access to AI literacy, strengthening pathways for international talent, and promoting accountability in AI-mediated hiring practices. Collectively, these efforts can better prepare international students for sustainable careers while fostering more equitable and inclusive AI-enabled labor markets.

Limitations and future research

Several limitations should be acknowledged. First, this study employed an integrative literature review methodology rather than primary empirical data collection. Consequently, findings are dependent upon 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. Some conclusions therefore 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 would also contribute significantly to literature.

CONCLUSION

Artificial intelligence is fundamentally transforming how educational investments, professional competencies, and career opportunities are understood within contemporary labor markets. For international students, these transformations extend beyond questions of employability and economic returns to encompass multilingual identities, technological adaptation, global mobility, and participation within increasingly AI-mediated professional environments.

The findings of this integrative literature review suggest that comparatively resilient educational pathways are characterized not exclusively by disciplinary affiliation but rather by their capacities to facilitate technological adaptation, career sustainability, and lifelong learning. STEM and healthcare disciplines emerged as comparatively resilient pathways within the reviewed literature because of projected labor market demand and opportunities for AI complementarity. However, sustainable career success ultimately depends upon the interaction among educational experiences, institutional support, technological competencies, multilingual identities, and equitable access to professional opportunities.

As argued throughout this review, international students should not be conceptualized exclusively as future workers or repositories of human capital, but as multilingual and culturally situated learners whose trajectories are shaped jointly by technological transformation, language ideologies, and global mobility processes.

Future scholarship examining artificial intelligence and career development should continue to investigate how multilingualism, algorithmic hiring practices, and technological inequalities influence educational and occupational opportunities among internationally mobile populations. Understanding these intersections will become increasingly important as artificial intelligence assumes more prominent roles in shaping both educational institutions and global labor markets.

Ultimately, preparing international students for sustainable careers in AI-driven economies will require institutions to move beyond narrow economic conceptions of employability toward more holistic and equitable approaches that recognize the complex relationships among technology, identity, language, and opportunity.

As discussed above, the findings collectively support and extend all three guiding frameworks: SCCT's emphasis on self-efficacy and contextual influences (now including AI-mediated recruitment systems), HCT's account of educational credentials as simultaneously human capital and immigration capital, and Bourdieu's demonstration that credentials alone do not guarantee recognized professional value. Career sustainability therefore emerges from the interaction of psychological, economic, sociocultural, technological, and immigration-related factors rather than from disciplinary choice or credential accumulation alone.

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The authors do not have any competing interests to declare.

Author contributions

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

Data availability

N/A

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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