Toward a Non-WEIRD Future Workforce Intelligence: A Mixed-Methods Framework for Women in STEM

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Abstract*– Current future workforce intelligence is at risk of becoming WEIRD (Western, Educated, Industrialized, Rich, and Democratic) workforce intelligence. As AI-driven workforce forecasting, skills intelligence, and Knowledge, Skills and Abilities (KSA) models increasingly inform educational and workforce policies, their reliance on Global North evidence may unintentionally reinforce existing gender inequalities in STEM (Science, Technology, Engineering and Mathematics) when applied to different regional contexts. Latin America offers an opportunity to generate non-WEIRD workforce intelligence by examining how local institutional conditions, gendered career trajectories, and emerging competency requirements interact amid AI-enabled workforce transformation. This research-to-practice paper proposes a sequential mixed-methods framework that connects AI-driven changes in occupational KSAs with individual career and learning trajectories, organizational and institutional conditions, and regional innovation ecosystems. The four-stage design combines contextual discovery in Argentina and Mexico with cross-country measurement validation and subsequent regional comparison to generate context-sensitive evidence for gender-responsive reskilling and upskilling strategies. Beyond presenting a research design, the paper argues for a broader shift toward a more inclusive future workforce intelligence that can inform equitable workforce policies, curriculum innovation, and lifelong learning strategies for AI-enabled STEM careers.

Keywords—Gender Studies, non-WEIRD studies, Higher Education, Future Workforce Skills, Women in STEM.

I. Introduction

Artificial intelligence (AI), automation, and other digital technologies are transforming work at an unprecedented pace, reshaping occupations, work organization, and the knowledge, skills, and abilities (KSAs) required across industries [1], [2]. These technologies are redefining tasks and increasing demand for adaptable, lifelong learners with both technical and human-centered competencies [3]. STEM (Science, Technology, Engineering, and Mathematics) professions are among the most impacted, requiring interdisciplinary thinking, digital fluency, and continuous reskilling to address increasingly complex societal and technological challenges [4], [5].

International organizations, including UNESCO and the OECD, identify lifelong learning, reskilling, and upskilling as strategic priorities for employability, innovation, and sustainable development [6], [7]. These developments have accelerated the emergence of the Future Workforce Intelligence (FWI) as an interdisciplinary field that combines labor market analytics, artificial intelligence, skills intelligence, educational research, and workforce forecasting to anticipate future competency needs.

Recent studies have produced increasingly sophisticated approaches for identifying emerging KSAs, forecasting occupational change, supporting curriculum redesign, and informing workforce planning [8], [9]. Governments, Higher Education Institutions (HEIs), employers, and international organizations are using these models to guide investments in talent development and lifelong learning. Their growing influence on educational and workforce policies makes it necessary to examine the assumptions embedded in the underlying data, models, and analytical frameworks.

One such assumption concerns the representativeness of the evidence on which FWI is built. Much of the literature relies on datasets, institutional contexts, and labor market evidence generated in the Global North [8], [9]. Entrepreneurship researchers have similarly questioned the predominance of WEIRD (Western, Educated, Industrialized, Rich, and Democratic) evidence and called for theories grounded in more diverse cultural and socioeconomic settings [10]. In artificial intelligence, concerns extend across the AI pipeline, where unequal representation in data collection, model development, and evaluation can produce systematic biases [11]. Together, these critiques suggest that FWI may inherit comparable contextual biases when its evidence base lacks geographic, institutional, gender, and socioeconomic diversity.

Latin America (LATAM) offers a valuable context for expanding Future Workforce Intelligence beyond WEIRD settings. The region combines heterogeneous higher education systems, diverse labor markets, increasing AI adoption, and persistent inequalities in STEM participation [12]. These conditions offer an opportunity to examine whether current assumptions about future skills, workforce readiness, and reskilling hold across different institutional and socioeconomic contexts, while generating evidence grounded in regional realities [13].

Gender remains one dimension insufficiently incorporated into FWI. Women have increased their participation in STEM education over recent decades, yet substantial disparities persist throughout the professional pipeline [14]. Consequently, existing FWI risks reproducing structural biases by generating

recommendations that primarily reflect WEIRD populations while overlooking the experiences of women in STEM in regions such as LATAM [15].

Women remain underrepresented in STEM, leadership positions, and senior academic ranks, reflecting the well-documented leaky pipeline phenomenon [16]. Their careers are influenced by structural barriers that include gender stereotypes, workplace bias, limited access to mentoring, lower self-efficacy, and challenges in balancing professional and personal responsibilities [17].

AI-driven workforce transformation can modify these dynamics by changing competency requirements, creating new career opportunities, and altering patterns of professional development. The literature has examined these issues from two largely independent perspectives. FWI has concentrated on future skills, AI readiness, workforce forecasting, and lifelong learning, with limited attention to gender as an explanatory variable. Research on women in STEM has generated substantial knowledge on participation, retention, leadership, mentoring, and organizational barriers. Still, it has rarely examined how AI-driven changes in occupational KSAs may reshape women's professional trajectories. The interaction between technological transformation, future competency requirements, and gender remains insufficiently understood, particularly in LATAM.

This paper addresses that intersection by proposing a sequential mixed-methods framework for studying the future workforce skills of women in STEM in LATAM. The framework is designed to generate context-sensitive evidence on how AI-driven workforce transformation interacts with local institutional conditions, gendered career trajectories, and emerging KSA requirements. The study contributes to developing a non-WEIRD FWI and provides a methodological foundation for designing gender-responsive reskilling and upskilling strategies that can inform universities, employers, policymakers, and professional organizations across the region.

As a research-to-practice contribution at the design stage, this paper does not report empirical findings. Its contribution is a testable methodological framework that defines the constructs, contextual dimensions, data-collection sequence, cross-country validation procedures, and the intended translation of evidence into educational, workforce, and innovation practices.

II. Towards a Non-WEIRD Workforce Intelligence

A. Future Workforce Intelligence

Future workforce research has evolved from analyses of technological disruption to increasingly sophisticated approaches that combine skills intelligence, labor-market analytics, and KSA mapping to anticipate occupational change and support curriculum and workforce planning [1], [2], [3]. This literature also emphasizes lifelong learning, reskilling, and upskilling as responses to continuous technological change, with HEIs playing an important role in developing workforce readiness [9], [18], [19], [20]. Despite these advances, some authors caution that future workforce research remains strongly oriented toward technological and economic requirements, with less attention to the social and institutional contexts in which competency development occurs [19]. Nevertheless, future workforce research still treats the workforce largely as a homogeneous population. Gender is seldom incorporated as an explanatory dimension in workforce intelligence models or KSA frameworks.

An implicit assumption underlying much of this literature is that future competency requirements are universally applicable across workers and regions. Skills intelligence models typically aggregate labor-market signals without considering how contextual factors, such as gender, institutional environments, or regional labor markets, shape the acquisition, recognition, and application of future competencies [21]. Consequently, workforce readiness is frequently conceptualized as a technical rather than a socio-technical phenomenon [20].

B. Women in STEM in LATAM

The presence of women in STEM careers in LATAM reflects educational progress, but it is not translating into active workforce participation. Women account for approximately 41% of undergraduate STEM enrollment in the regional evidence reported by [22], yet women hold only about one in three STEM positions in LATAM, with lower representation in fields such as artificial intelligence and machine learning [13], [22]. These figures suggest that increased educational participation has not translated proportionally into professional representation, pointing to important losses during the education-to-employment transition and subsequent career progression [12], [22]. Representation declines as one ascends the professional hierarchy, reflecting persistent glass-ceiling effects. Globally, female participation in research reached 41% in 2022 but declined sharply to 27% at advanced research stages, where women are underrepresented in national academies and leadership positions [14], [22]. This phenomenon is called the leaky pipeline: a process of progressive leaks of female talent that begins during the transition from middle to higher education and is more pronounced at the PhD level and in academic careers [15]. The main causes are organizational and cultural barriers; implicit biases; masculinized hierarchical structures and inflexible work schemes; and unequal access to professional networks and mentorship programs. These factors are identified as determinants of women's retention and advancement in STEM [16]. AI-enabled workplaces add a new dimension to these longstanding challenges.

Future workforce policies increasingly rely on skills intelligence, competency frameworks, and workforce forecasting to guide educational planning, reskilling investments, and talent development. However, these instruments generally assume that workers experience technological transitions in similar ways, paying limited attention to how gender influences career opportunities, access to lifelong learning, professional mobility, and the acquisition

of future KSAs [9], [21]. In LATAM, this limitation is further amplified by the diversity of higher education systems, industrial sectors, labor market structures, innovation ecosystems, and public policies that shape women's professional experiences across countries [12], [13].

Consequently, evidence generated in other regions cannot be assumed to represent the realities of women in STEM throughout LATAM without contextual validation. Understanding how these regional and institutional factors interact with AI-driven workforce transformation is essential for developing equitable Future Workforce Intelligence. This need for context-sensitive evidence naturally leads to examining whether the datasets, models, and assumptions underpinning current workforce intelligence are themselves affected by WEIRD biases.

C. *The WEIRD Bias in Future Workforce Research*

Future workforce intelligence is increasingly built on large-scale datasets, AI-driven skills intelligence, occupational forecasting models, and global labor market reports, which are assumed to provide objective evidence for educational planning and workforce policy. Yet these models' validity depends fundamentally on who the underlying data represent and whose experiences remain invisible [8]. However, these data sources frequently reflect WEIRD populations, limiting their representativeness across diverse cultural, institutional, and socioeconomic contexts [23]. AI systems inherit these biases throughout the AI pipeline, from data collection and model development to evaluation, leading to uneven performance and reinforcing the underrepresentation of many populations [11]. Consequently, workforce intelligence may reproduce epistemic biases by privileging the experiences of overrepresented populations while overlooking regional, cultural, and gender-specific pathways through technological transformation. Similarly, research on AI careers reveals persistent gender disparities and emphasizes the scarcity of granular, gender-disaggregated workforce data needed to understand emerging occupations [24].

Although AI can help mitigate bias in specific contexts, its effects remain highly dependent on data quality and organizational implementation [25]. More broadly, diversity has been shown to improve organizational decision-making by reducing blind spots and enriching knowledge production, suggesting that homogeneous perspectives also limit workforce intelligence itself [26]. This disconnect reveals a double-blind spot. Future workforce research rarely treats gender as an explanatory dimension, while women-in-STEM research seldom examines how AI-driven changes reshape future competency requirements. Bridging these perspectives requires moving beyond WEIRD evidence to context-sensitive workforce intelligence that can inform equitable educational and workforce policies. This limitation also affects regional innovation and entrepreneurship ecosystems.

Women in STEM contribute not only as employees but also as researchers, technology leaders, innovators, intrapreneurs, and founders whose capacity to participate in AI-enabled innovation depends on access to emerging competencies, professional networks, and continuous learning opportunities. From this perspective, inclusive FWI can provide regional ecosystems with evidence about where future-skill gaps intersect with structural barriers to women's participation in innovation. A non-WEIRD approach therefore extends beyond employability: it can support the development of more inclusive regional talent pipelines and strengthen the human capabilities on which technology-based entrepreneurship and innovation depend [10].

III. Research Design and Framework

Future Workforce Intelligence increasingly informs educational planning, talent development, and workforce policies. However, existing models have been developed predominantly on evidence from WEIRD contexts, limiting their capacity to explain how AI-driven workforce transformation unfolds across different regions and populations. LATAM offers an opportunity to develop context-sensitive evidence by examining the interactions among technological change, institutional conditions, and gendered career trajectories in STEM. The purpose of this study is to design a mixed-methods framework and specify a validation strategy to generate a non-WEIRD Future Workforce Intelligence for women in STEM in LATAM. The framework will identify emerging KSA requirements, explain the factors influencing women's preparedness for AI-enabled workplaces, and generate evidence to support gender-responsive reskilling and upskilling strategies. The study is guided by the following research question:

What factors explain the differential impact of AI and other emerging technologies on the careers and professional development of women in STEM in LATAM?

The proposed non-WEIRD FWI framework conceptualizes women's preparedness for AI-enabled STEM careers as the outcome of interactions among four analytical domains: AI-driven changes in occupational KSA requirements; individual career and learning trajectories, including self-efficacy, professional mobility, and participation in reskilling and lifelong learning; organizational and institutional conditions, including inclusion, mentoring, career development support, and access to learning opportunities; and national and regional ecosystem conditions, including higher education structures, labor markets, industrial specialization, innovation systems, and gender-related policies.

Gender and regional context are therefore treated as analytical dimensions that can modify relationships among technological change, access to competency development, and career outcomes, rather than as demographic control variables. The four-stage mixed-methods process described below provides the mechanism through which these relationships will be explored, operationalized, tested, and compared across contexts. The resulting architecture connects AI-driven changes

in occupational KSA requirements with individual career trajectories, organizational and institutional conditions, and regional ecosystem characteristics to explain women's preparedness for AI-enabled STEM careers. Fig. 1 distinguishes the conceptual architecture of the proposed framework from the methodological process through which its constructs and relationships will be explored, operationalized, and validated.

A sequential exploratory mixed-methods design has been selected because current knowledge is insufficient to explain the interaction between AI-driven workforce transformation and women's professional trajectories in STEM. The qualitative phase will provide an in-depth understanding of these dynamics and will inform the development of the quantitative instrument, allowing context-specific evidence to emerge before broader validation.

The framework comprises four interconnected stages and complements existing KSA taxonomies and forecasting approaches [2], [3], [28]. Existing approaches identify what competencies are emerging, declining, or becoming strategically important in changing labor markets. The present framework addresses a different question: whether workers have comparable opportunities to acquire, demonstrate, and benefit from those competencies across different gendered, institutional, and regional contexts.

It therefore connects the *demand side* of FWI, changing occupational KSAs, with the *supply and opportunity sides* represented by career trajectories, access to reskilling, organizational support, and regional learning and innovation ecosystems. This additional layer is essential for determining whether an identified skills gap reflects a competency deficit alone or also unequal access to the conditions through which future competencies are developed and recognized.

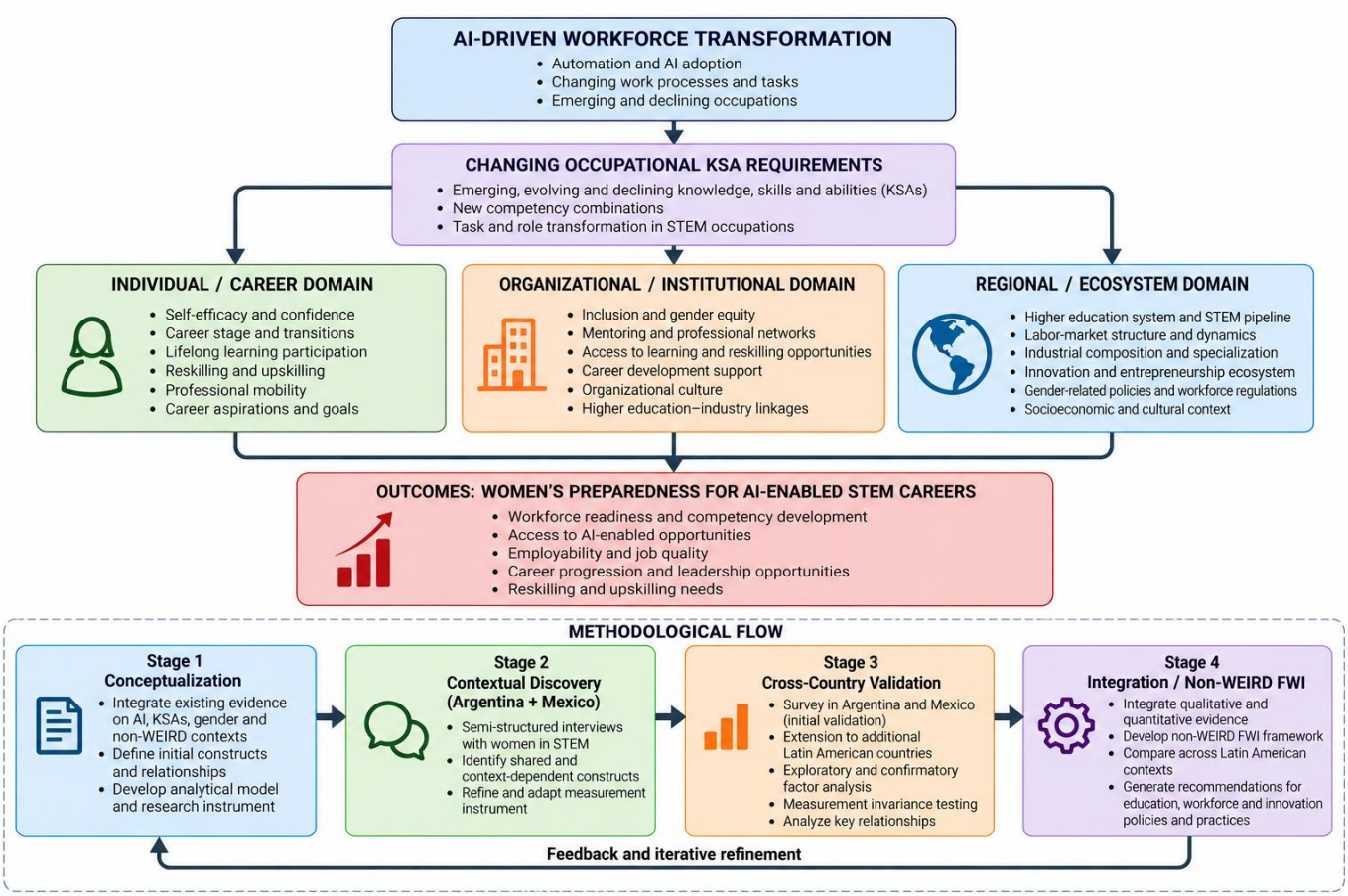


Fig. 1 Proposed non-WEIRD *Future Workforce Intelligence (FWI)* framework for women in STEM.

Stage 1. Conceptualization. The study begins with a structured literature review on Future Workforce Intelligence, women in STEM, AI-enabled workforce transformation, and non-WEIRD research. This stage establishes the theoretical foundation, identifies preliminary constructs, and supports the development of the qualitative protocol.

Stage 2. Contextual Discovery. Semi-structured interviews will be conducted with women working in STEM occupations, engineering managers, human resource professionals, and higher education leaders from two different LATAM countries: Argentina and Mexico. The interviews will explore career transitions, AI adoption, changing competency requirements, organizational support, barriers to professional advancement, and experiences with reskilling and lifelong learning [28]. Thematic analysis will identify context-specific patterns not adequately represented in existing workforce intelligence models. Argentina and Mexico are selected as contrasting initial contexts for construct discovery, not as representative proxies for Latin America. This phase aims to identify both shared and context-dependent dimensions to inform an initial measurement model. Before regional deployment, collaborators from participating countries will review and adapt the constructs derived from these interviews. This procedure is intended to prevent experiences observed in the two initial settings from being prematurely generalized to the heterogeneous realities of LATAM. Before data collection, the study protocol will undergo the corresponding institutional ethics review. All participants will provide informed consent and will be informed that participation is voluntary, that they may withdraw, and that procedures are in place to protect confidentiality. Interview transcripts will be de-identified, and reporting will avoid organizational or contextual details that could identify participants, particularly when discussing workplace discrimination, bias, or barriers to career advancement.

Stage 3. Cross-Country Validation. Findings from the qualitative phase will inform the development of a survey instrument to be initially validated in Argentina and Mexico and subsequently extended, through regional research partners, to additional LATAM countries. Country inclusion in the regional phase will depend on the availability of collaborating institutions capable of recruiting women working in STEM occupations and ensuring contextual adaptation of the instrument; therefore, countries beyond Argentina and Mexico are not predetermined at this work-in-progress stage. The sampling frame will target adult women currently employed in STEM-related professional or academic occupations across different career stages and sectors. Initial validation will target at least 200 valid responses for exploratory factor analysis, depending on the final number of items and dimensionality emerging from the qualitative phase. Sample requirements for subsequent confirmatory factor analysis and multi-country measurement invariance testing will be determined through an *a priori* power and model-complexity assessment once the final instrument is specified. Exploratory factor analysis will first examine the latent structure, followed by reliability and construct-validity assessment. Subsequent multi-country validation will use confirmatory factor analysis and tests of measurement invariance to determine whether the constructs operate comparably across national contexts before substantive cross-country comparisons are performed, as discussed in Section V. Regression or structural models will then examine relationships among AI exposure, emerging KSA requirements, organizational inclusion, self-efficacy, access to reskilling, lifelong learning participation, and career outcomes [27].

Stage 4. Integration / Non-WEIRD FWI. The final stage integrates qualitative and quantitative findings to explain how AI-driven workforce transformation affects women in STEM across different institutional and national contexts. The combined evidence will support identifying readiness gaps, enabling conditions, and priority areas for intervention, providing a foundation for context-sensitive FWI. These integrated findings will constitute the empirical basis for the educational, workforce, policy, and innovation applications discussed in Section IV.

IV. Expected Contributions to Research and Practice

This study builds upon complementary research trajectories developed by the authors in Mexico and Argentina, bringing together expertise in FWI, future skills, Education 4.0, lifelong learning, and women in STEM to address a challenge that neither research stream has examined independently. Previous collaborative work has advanced the understanding of skills obsolescence, Industry 4.0 competencies, digital literacy, active learning, thinking diversity, and future skills for emerging generations, while parallel research has explored women's participation, retention, and professional development in STEM across LATAM.

The principal methodological contribution is therefore not the use of mixed methods itself, but the integration of KSA demand with gendered access to competency development and the institutional and regional conditions shaping workforce readiness. This approach is expected to reveal whether apparent skills gaps reflect competency deficits, unequal access to reskilling opportunities, or interactions between both.

From a practical perspective, the proposed framework is intended to generate evidence that supports decision-making across higher education, industry, and public policy in contexts where AI-driven workforce transformation is reshaping STEM careers.

- In higher education, the findings can inform curriculum redesign, competency-based education, microcredentials, lifelong learning pathways, and faculty development initiatives to prepare women for emerging AI-enabled occupations.
- For employers and professional associations, the study is expected to identify context-specific barriers and enabling conditions for recruitment, retention, leadership

development, mentoring, career progression, and reskilling and upskilling programs.

- At the policy level, the resulting evidence can inform national and regional strategies for digital transformation, workforce development, gender equity, and innovation by guiding investments in skills development and lifelong learning ecosystems.

For regional innovation ecosystems, the framework can identify where gendered barriers to future-skill acquisition constrain women's participation as technology professionals, researchers, innovators, intrapreneurs, and entrepreneurs, providing evidence for more inclusive talent and innovation strategies. The framework also provides HEIs with an evidence-based approach for aligning engineering and STEM education with future workforce needs while reducing gender biases embedded in current competency models.

V. Discussion and Future Work

A central methodological challenge is achieving cross-country comparability without erasing contextual differences, a problem that is particularly consequential for a non-WEIRD framework. The study will therefore treat measurement equivalence as an explicit validation requirement rather than assuming that constructs developed in one setting operate identically elsewhere. Following country-level contextual adaptation, the quantitative phase will assess measurement invariance sequentially at configural, metric, and scalar levels. Configural invariance will examine whether the same construct structure is supported across countries; metric invariance will assess whether relationships between indicators and constructs are comparable; and scalar invariance will determine whether latent means can be meaningfully compared. Where full invariance is not supported, we will consider partial invariance and country-specific interpretations instead of forcing uniformity. In this framework, failure to establish equivalence is itself informative: it may reveal precisely the institutional, cultural, or labor-market differences that a non-WEIRD approach is intended to identify.

The paper therefore invites the academic and professional communities to develop a shared LATAM agenda for Non-WEIRD FWI. Achieving the full employability of women in STEM requires evidence that reflects the diversity of educational pathways, labor markets, and innovation ecosystems across the region. Generating this evidence is a collective responsibility. Without greater participation from LATAM researchers and institutions, future workforce intelligence will remain shaped largely by experiences from WEIRD contexts, limiting its capacity to support equitable workforce policies and lifelong learning strategies. Building this evidence base will require a regional research network capable of extending the framework beyond Argentina and Mexico, testing its contextual validity across diverse LATAM ecosystems, and positioning Latin American evidence as a substantive contribution to global Future Workforce Intelligence.

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References

[1] H.-C. Chang, C.-Y. Wang, and S. Hawamdeh, "Emerging trends in data analytics and knowledge management job market: extending KSA framework," *Journal of Knowledge Management*, vol. 23, no. 4, pp. 664–686, Jan. 2018, doi: 10.1108/JKM-02-2018-0088.

[2] L. J. González-Gómez, V. Rueda-Castro, G. M. Chans, G. Zavala, J. Noguez, and P. Caratozzolo, "A Machine Learning Model of Knowledge, Skills, and Abilities (KSA) for Industry 4.0 Workforce," in *Technological Advancements and Innovations in Future of Education*, S. Hosseini, B. Beitzel, M. Köhler, and F. Sanjakdar, Eds., Singapore: Springer Nature, 2025, pp. 387–396. doi: 10.1007/978-981-97-4931-7_30.

[3] P. Caratozzolo *et al.*, "A Matrix Taxonomy of Knowledge, Skills, and Abilities (KSA) Shaping 2030 Labor Market," in *2023 IEEE Frontiers in Education Conference (FIE)*, Oct. 2023, pp. 1–8. doi: 10.1109/FIE58773.2023.10342955.

[4] S. B. Ng, "Exploring STEM Competences for the 21st Century." 2019.

[5] S. Chakrabarti, P. Caratozzolo, B. Norgaard, and E. Sjoer, "Preparing Engineers for Lifelong Learning in the Era of Industry 4.0," in *2021 World Engineering Education Forum/Global Engineering Deans Council (WEEF/GEDC)*, Nov. 2021, pp. 518–523. doi: 10.1109/WEEF/GEDC53299.2021.9657247.

[6] UNESCO, "Embracing a culture of lifelong learning." Accessed: Nov. 08, 2022. [Online]. Available: https://uil.unesco.org/lifelong-learning/embracing-culture-lifelong-learning

[7] OECD, "Future of Work," What is future of work. Accessed: Feb. 12, 2023. [Online]. Available: https://www.oecd.org/future-of-work/#what-is-the-future-of-work

[8] W. M. Lim, "The workforce revolution: Reimagining work, workers, and workplaces for the future," *Global Business and Organizational Excellence*, vol. 42, no. 4, pp. 5–10, 2023, doi: 10.1002/joe.22218.

[9] L. Li, "Reskilling and Upskilling the Future-ready Workforce for Industry 4.0 and Beyond," *Inf Syst Front*, vol. 26, no. 5, pp. 1697–1712, Oct. 2024, doi: 10.1007/s10796-022-10308-y.

[10] D. A. Shepherd, J. Wincent, and S. R. Chase, "What If We Are the WEIRD Ones? A Call (and Roadmap) for More Non-WEIRD Entrepreneurship Research," *Entrepreneurship Theory and Practice*, vol. 49, no. 5, pp. 1223–1260, Sep. 2025, doi: 10.1177/10422587251347051.

[11] R. Mihalcea *et al.*, "Why AI Is WEIRD and Shouldn't Be This Way: Towards AI for Everyone, with Everyone, by Everyone," *Proceedings of the AAAI Conference on Artificial Intelligence*, vol. 39, no. 27, pp. 28657–28670, Apr. 2025, doi: 10.1609/aaai.v39i27.35092.

[12] E. Campos, C. L. Garay-Rondero, P. Caratozzolo, A. Dominguez, and G. Zavala, "Women Retention in STEM Higher Education: Systematic Mapping of Gender Issues," in *Women in STEM in Higher Education*, Singapore: Springer Nature, 2022, pp. 127–142. doi: 10.1007/978-981-19-1552-9_7.

[13] V. Lara-Prieto *et al.*, "Women inspiring women in STEM professional careers: Journeys from Latin America," *LACCEI*, vol. 1, no. 8, Jul. 2023, doi: 10.18687/LACCEI2023.1.1.1146.

[14] N. Kaur and P. Arora, "Acknowledging Gender Diversity and Inclusion as Key to Organizational Growth: A Review and Trends," *jcr*, vol. 7, no. 06, Apr. 2020, doi: 10.31838/jcr.07.06.25.

[15] M. Y. Byrd and C. L. Scott, *Diversity in the Workforce: Current Issues and Emerging Trends*. Taylor & Francis, 2024.
[16] S. Verdugo-Castro, A. García-Holgado, and M. C. Sánchez-Gómez, "The gender gap in higher STEM studies: A systematic literature review," *Heliyon*, vol. 8, no. 8, Aug. 2022, doi: 10.1016/j.heliyon.2022.e10300.
[17] M. Swafford and R. Anderson, "Addressing the Gender Gap: Women's Perceived Barriers to Pursuing STEM Careers," *Journal of Research in Technical Careers*, vol. 4, no. 1, p. 61, Jan. 2020, doi: 10.9741/2578-2118.1070.
[18] M. Nakash, "Reskilling and Upskilling the Workforce: Text Mining to Identify Patterns and Trends in Research," *ICRHRM*, vol. 1, no. 1, May 2024, doi: 10.33422/icrhrm.v1i1.169.
[19] T. Palenski, L. Hills, S. Unnikrishnan, and R. Eynon, "How AI Works: Reconfiguring Lifelong Learning," *Postdigit Sci Educ*, vol. 6, no. 4, pp. 1216–1239, Dec. 2024, doi: 10.1007/s42438-024-00496-y.
[20] B. Pandya, U. Ruhi, and L. Patterson, "Preparing the future workforce for 2030: the role of higher education institutions," *Front. Educ.*, vol. 8, Dec. 2023, doi: 10.3389/feduc.2023.1295249.
[21] H. Gruenewald and M. Mueller, "Challenges and Opportunities in Reskilling and Upskilling," in *Reskilling and Upskilling in a Globalized Economy: Essential Strategies for Workforce Transformation*, H. Gruenewald and M. Mueller, Eds., Wiesbaden: Springer Fachmedien, 2025, pp. 167–201. doi: 10.1007/978-3-658-48384-5_7.
[22] UNDP - United Nations Development Programme, "Coded Bias: The underrepresentation of women in STEM in Latin America and the Caribbean," UNDP. Accessed: Jul. 13, 2026. [Online]. Available: https://www.undp.org/latin-america/blog/coded-bias-underrepresentation-women-stem-latin-america-and-caribbean
[23] M. J. Bosch, "Beyond WEIRD Countries: Work-Life Management across the Globe," in *Work-Nonwork Management*, Routledge, 2025.
[24] E. Young, J. Wajcman, and L. Sprejer, "Mind the gender gap: Inequalities in the emergent professions of artificial intelligence (AI) and data science," *New Technology, Work and Employment*, vol. 38, no. 3, pp. 391–414, 2023, doi: 10.1111/ntwe.12278.
[25] M. Avery, A. Leibbrandt, and J. Vecci, "Does Artificial Intelligence Help or Hurt Gender Diversity? Evidence from Two Field Experiments on Recruitment in Tech," 2024, *Social Science Research Network, Rochester, NY*: 4764343. doi: 10.2139/ssrn.4764343.
[26] I. Chiru, C. Ivan, and R. Arcos, "Diversity in Intelligence: Organizations, Processes, and People," *International Journal of Intelligence and CounterIntelligence*, vol. 35, no. 4, pp. 607–620, Oct. 2022, doi: 10.1080/08850607.2022.2047533.
[27] P. Caratozzolo, U. Cukierman, B. Nørgaard, K. Schrey-Niemenmaa, J. D. Azofeifa, and V. Rueda-Castro, "Future Skills Forecasting: Ensuring Quality Learning for Every Segment of the Workforce," presented at the 2024 IEEE Global Engineering Education Conference, May 2024, pp. 1–5. doi: 10.1109/EDUCON60312.2024.10578916.
[28] M. R. Forte-Celaya, M. Y. Burgos-López, V. Lara-Prieto, C. Ramírez-Figueroa, and D. Franco-Peñuelas, "Professional development support for women engineering faculty with Lean In Circles," in *2021 World Engineering Education Forum/Global Engineering Deans Council (WEEF/GEDC)*, Nov. 2021, pp. 1–8. doi: 10.1109/WEEF/GEDC53299.2021.9657270.