
THE ROLE OF HIGHER EDUCATION IN PROMOTING WOMEN'S LINGUISTIC AND DIGITAL COMPETENCIES IN THE AGE OF ARTIFICIAL INTELLIGENCE: A CENTRAL ASIAN PERSPECTIVE

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ABSTRACT

The rapid development of artificial intelligence (AI) is fundamentally transforming contemporary higher education systems, reshaping academic communication, digital learning environments, and professional competencies required in the global knowledge economy. In this context, higher education institutions are increasingly expected not only to provide technological literacy, but also to promote inclusive academic participation through the development of linguistic and digital competencies, particularly among women. This study explores the role of higher education in empowering women's linguistic and digital capacities in the age of artificial intelligence, with special attention to the Central Asian higher education context, and Uzbekistan in particular, and to how academic visibility, participation, and access are shaped within multilingual and digitally mediated educational environments.

The article argues that linguistic competence, especially proficiency in global academic communication, has become a critical form of intellectual and symbolic capital in AI-driven educational ecosystems. Simultaneously, digital competencies such as AI literacy, information navigation, digital communication, and technology-mediated collaboration are increasingly influencing women's opportunities for academic participation and professional advancement. Despite ongoing digital transformation, women in Central Asia and other multilingual, developing contexts continue to face structural barriers related to linguistic inequality, limited digital access, and insufficient institutional support.

Using a qualitative and interdisciplinary approach, the study synthesizes perspectives from higher education policy, sociolinguistics, gender studies, and digital education research. The paper analyzes how universities can function as transformative spaces that foster equitable access to linguistic resources, AI-related competencies, and international academic engagement for women learners and researchers. The study further examines the relationship between language, gender, and digital inclusion within the broader framework of higher education internationalization and technological modernization.

The findings suggest that the future effectiveness of higher education in the AI era depends not solely on technological integration, but also on the extent to which institutions create linguistically inclusive, gender-responsive, and digitally accessible learning environments. The article contributes to current discussions on artificial intelligence in education by highlighting the strategic importance of women's linguistic and digital empowerment as a prerequisite for sustainable and inclusive academic development in the twenty-first century.

KEYWORDS: Artificial Intelligence, Women's Empowerment, Linguistic Competencies, Digital Competencies, Gender Inclusion, AI Literacy, Linguistic Capital, Digital Transformation

INTRODUCTION

The twenty-first century has witnessed an unprecedented transformation in higher education driven by rapid technological advancement, globalization, and the growing influence of artificial intelligence (AI). Universities are no longer viewed solely as institutions responsible for transmitting knowledge; rather, they have become dynamic environments that shape digital competencies, academic communication, innovation, and global participation. In this evolving educational landscape, the integration of artificial intelligence into higher education is fundamentally changing how knowledge is produced, accessed, disseminated, and evaluated.

Artificial intelligence technologies are increasingly influencing teaching methodologies, academic research, digital communication, assessment systems, and professional development. AI-powered educational platforms, automated language tools, adaptive learning systems, and digital research environments have expanded opportunities for students and researchers worldwide. However, the benefits of AI-driven transformation are not distributed equally. Existing social, linguistic, and gender inequalities continue to shape access to digital resources, academic visibility, and participation in global knowledge production.

Within this context, women's participation in higher education requires renewed scholarly attention. Although women's enrollment in universities has increased globally, many female students and researchers continue to encounter barriers related to technological access, digital literacy, academic language proficiency, and representation within international academic networks. These challenges become particularly visible in Central Asia, a region characterized by multilingual educational systems, ongoing higher education reform, and uneven digital infrastructure, where linguistic limitations may restrict women's opportunities for academic advancement and global engagement.

I approach this topic as a woman and an undergraduate English-language student at Uzbekistan State World Languages University. My own experience navigating academic English, digital learning platforms, and emerging AI tools as a student in Uzbekistan informs the perspective taken throughout this article and situates its analysis within the lived realities of women pursuing higher education in Central Asia today.

In the age of artificial intelligence, linguistic competence has become more than a communication skill; it increasingly functions as a form of academic and symbolic capital. Proficiency in English and other international academic languages significantly influence access to scholarly publications, international collaboration, digital research platforms, and AI-mediated communication systems. Consequently, women's linguistic competencies directly affect their academic visibility, participation, and competitiveness within contemporary higher education environments.

At the same time, digital competencies are emerging as essential components of academic success and professional sustainability. Skills related to AI literacy, information management, online communication, digital collaboration, and critical engagement with emerging technologies are becoming fundamental requirements in modern educational systems. Higher education institutions therefore play a critical role in preparing women not only for participation in digital society, but also for active leadership within AI-driven academic and professional ecosystems.

Despite the growing body of literature on artificial intelligence in education, insufficient attention has been devoted to the intersection of gender, linguistic competencies, and digital inclusion in higher education. Existing studies frequently examine technological innovation separately from questions of linguistic accessibility and women's academic empowerment. Therefore, there remains a significant research gap concerning how higher education institutions can promote both linguistic and digital competencies among women in ways that support equitable academic participation and sustainable educational development.

This article aims to explore the role of higher education in promoting women's linguistic and digital competencies in the age of artificial intelligence. The study investigates how universities can contribute to reducing linguistic and digital inequalities while fostering women's academic visibility and participation in technologically mediated educational environments. Furthermore, the paper examines the relationship between AI-driven transformation, gender inclusion, linguistic capital, and higher education internationalization within contemporary global academia.

LITERATURE REVIEW

The growing integration of artificial intelligence into higher education has generated extensive scholarly discussion regarding digital transformation, educational innovation, and the future of academic competencies. Researchers increasingly emphasize that higher education institutions are undergoing a significant structural shift influenced by AI-powered technologies, automated learning systems, digital communication platforms, and data-driven educational practices (Luckin et al., 2016). These transformations are redefining not only teaching and learning processes, but also the competencies required for academic participation and professional sustainability in contemporary society.

One of the central themes in recent educational research concerns the role of digital competencies in preparing students for participation in technologically advanced environments. Digital competence is generally understood as the ability to effectively use digital technologies for communication, information management, problem-solving, collaboration, and knowledge creation (Ferrari, 2013). In the context of artificial intelligence, this concept has expanded to include AI literacy, algorithmic awareness, critical digital thinking, and the ability to engage responsibly with intelligent technologies (Ng et al., 2021). Scholars argue that universities must move beyond traditional models of education and equip learners with interdisciplinary digital skills necessary for navigating AI-mediated academic and professional ecosystems.

Simultaneously, sociolinguistic and educational studies highlight the increasing importance of linguistic competence in global academia. Language, particularly English as an international academic language, functions as a significant form of symbolic and linguistic capital within higher education (Bourdieu, 1991). According to Bourdieu's theory of linguistic capital, language proficiency influences individuals' access to power, recognition, and participation within institutional structures. In contemporary academic environments, linguistic competence affects access to international publications, research collaboration, conferences, digital resources, and scholarly communication platforms.

The relationship between language and digital transformation has become especially significant in AI-driven educational contexts. Artificial intelligence technologies, including automated translation systems, academic search engines, language learning applications, and

digital research tools, increasingly rely on dominant global languages. Consequently, individuals with stronger linguistic competencies are often better positioned to benefit from digital educational opportunities (Pennycook, 2020). Scholars have therefore raised concerns regarding linguistic inequality in global higher education, particularly among students and researchers from multilingual or developing contexts.

Gender scholars further emphasize that digital transformation does not automatically eliminate existing inequalities. Although technological advancement creates new opportunities for inclusion, women continue to face multiple barriers related to access, representation, technological confidence, and participation in digital environments (UNESCO, 2023). Studies on women in higher education reveal persistent disparities in academic leadership, scientific visibility, publication rates, and participation in technologically intensive fields (Morley & Crossouard, 2016). In many societies, structural and cultural factors continue to shape women's access to educational and digital resources.

Emerging evidence from Uzbek universities lends some support to these broader claims. In a survey-based study of students at Karakalpak State University, Ashirov (2025) found that platforms such as Telegram and YouTube were widely used for informal English learning, with students reporting gains particularly in listening and speaking skills, suggesting that digital, informal learning spaces can meaningfully supplement formal instruction in a Central Asian context. Similarly, Borasheva (2025) reported that a flipped-classroom model implemented with primary-education majors in Uzbekistan produced measurable gains in language achievement compared with traditional instruction. Together, these regional studies suggest that digital-pedagogical innovation is already reshaping language learning outcomes in Central Asian higher education, even as broader structural barriers to women's digital and linguistic inclusion persist.

Recent research also demonstrates that women's academic visibility increasingly depends on both linguistic and digital competencies. The ability to communicate effectively in international academic discourse, engage with digital platforms, utilize AI-based educational tools, and participate in global research networks has become essential for academic recognition and professional growth. However, unequal access to these competencies may reinforce existing forms of academic exclusion and epistemic inequality (Connell, 2019).

In response to these challenges, higher education institutions are increasingly encouraged to adopt gender-responsive and inclusive educational policies. International organizations such as UNESCO and the OECD emphasize equitable access to digital education, artificial intelligence literacy, multilingual learning environments, and women's participation in technological innovation (OECD, 2021). Universities must therefore serve not only as centers of technological advancement but also as institutions that promote social inclusion, linguistic accessibility, and sustainable educational development. This responsibility includes ensuring that educators possess the knowledge and skills necessary to support English language learners effectively. When teachers lack expertise in English learner instruction, they may rely on subjective assumptions or biased interpretations rather than evidence-based practices. Educational leaders must provide faculty and staff with appropriate training, resources, and research-informed instructional principles to ensure that the growing English learner population receives equitable access to high-quality education (Chiaramonte, 2025).

Despite the expanding literature on artificial intelligence and higher education, limited research has specifically explored the interconnected relationship between women's linguistic

competencies, digital competencies, and academic visibility within AI-driven educational systems. Existing studies often examine gender, language, or digital transformation separately rather than as interconnected dimensions of contemporary higher education. Therefore, this study seeks to contribute to the current scholarly discourse by examining how higher education institutions can support women's linguistic and digital empowerment within the broader context of artificial intelligence and educational transformation.

METHODOLOGY & ANALYTICAL FRAMEWORK

This study employs an interdisciplinary research design to explore the role of higher education in promoting women's linguistic and digital competencies in the age of artificial intelligence. Considering the multidimensional nature of the research topic, the study integrates perspectives from higher education studies, sociolinguistics, gender studies, digital education, and artificial intelligence in education (Creswell, 2014).

The research primarily relies on qualitative content analysis initiated by the researcher and document analysis methods. Academic literature, international policy reports, and scholarly publications related to artificial intelligence, higher education, women's empowerment, linguistic capital, and digital competencies were systematically analyzed to identify dominant theoretical approaches, emerging educational trends, and existing research gaps (Bowen, 2009). Attention was devoted to the examination of contemporary discussions surrounding AI-driven educational transformation and its implications for gender inclusion and linguistic accessibility.

The study also incorporates a policy-oriented analytical framework. International educational policy documents published by UNESCO, OECD, and other global educational organizations were reviewed to examine how contemporary higher education policies address women's digital inclusion, AI literacy, multilingual education, and equitable academic participation (UNESCO, 2023; OECD, 2021). These documents were selected because of their significant influence on global higher education reforms and digital education strategies.

Furthermore, the research adopts a sociolinguistic perspective grounded in Bourdieu's concept of linguistic capital. This theoretical framework allows the study to analyze how language proficiency functions as a form of symbolic and academic power within AI-mediated educational environments (Bourdieu, 1991). In this context, linguistic competence is examined not only as a communicative skill, but also as a strategic resource affecting women's academic visibility, international participation, and access to global knowledge networks.

The study additionally draws upon concepts from digital competence theory and gender-responsive education frameworks. The integration of these perspectives enables a broader understanding of how higher education institutions can contribute to reducing digital and linguistic inequalities among women learners and researchers (Ferrari, 2013; Morley & Crossouard, 2016).

Since the article is conceptual and analytical in nature, the research does not involve experimental procedures or quantitative statistical analysis. Instead, it focuses on critical interpretation, comparative synthesis of scholarly perspectives, and theoretical examination of current educational transformations associated with artificial intelligence (Denzin & Lincoln, 2018).

The methodological approach of this study aims to provide a comprehensive understanding of the interconnected relationship between artificial intelligence, higher education, women's empowerment, linguistic competencies, and digital inclusion. Through this interdisciplinary

framework, the article seeks to contribute to contemporary academic discussions on equitable and sustainable higher education development in the digital era.

DISCUSSION

The findings of this study demonstrate that higher education institutions play a crucial role in shaping women's linguistic and digital competencies in the era of artificial intelligence. As AI technologies increasingly influence educational systems, academic communication, and global knowledge production, universities are becoming central spaces where digital inclusion, linguistic accessibility, and gender-responsive development intersect (Luckin et al., 2016).

One of the most significant issues identified in this study is the growing importance of linguistic competence in AI-mediated academic environments. In contemporary higher education, language proficiency, particularly in English as an international academic language, functions not only as a communication tool but also as a form of symbolic and intellectual capital (Bourdieu, 1991). Women with stronger linguistic competencies are more likely to participate in international academic networks, publish research in indexed journals, engage in global scholarly communication, and access AI-supported educational resources. Consequently, linguistic competence increasingly determines academic visibility and professional competitiveness in digital educational ecosystems.

At the same time, the study reveals that digital competencies are becoming equally essential for women's academic participation. AI literacy, information management skills, online collaboration, digital communication, and the ability to navigate technology-mediated learning environments are now fundamental components of higher education (Ng et al., 2021). However, women in Central Asia and other multilingual, developing contexts continue to face challenges associated with unequal access to digital infrastructure, limited technological training, and insufficient institutional support (UNESCO, 2023). These barriers may contribute to new forms of digital and academic inequality despite the rapid expansion of educational technologies.

The discussion further indicates that higher education institutions must move beyond purely technological modernization and adopt more inclusive educational strategies. The integration of artificial intelligence into universities should not focus exclusively on efficiency, automation, or digital innovation. Instead, educational reforms must also address issues of gender inclusion, linguistic equity, and equitable access to digital competencies (OECD, 2021). Universities therefore have a responsibility to create educational environments where women can actively develop the linguistic and technological capacities necessary for meaningful participation in global academia.

Another important aspect highlighted by this study concerns the relationship between language and power in contemporary educational systems. AI technologies often prioritize dominant global languages, particularly English, within digital platforms, automated academic tools, and online research environments (Pennycook, 2020). As a result, students and researchers from multilingual backgrounds may experience linguistic disadvantages in accessing global academic resources and opportunities. Women may be disproportionately affected by these inequalities due to existing social, cultural, and institutional barriers. Therefore, multilingual educational policies and linguistically inclusive digital practices remain essential components of equitable higher education development.

Furthermore, the findings suggest that women's academic empowerment in the AI era depends not solely on access to education, but also on access to visibility. Academic visibility increasingly emerges through participation in digital scholarly communication, online publication systems, virtual conferences, international research collaboration, and AI-assisted academic networks. In this context, linguistic and digital competencies become interconnected mechanisms through which women gain recognition, representation, and influence within global higher education systems (Connell, 2019).

The study also emphasizes the importance of gender-responsive educational policies in addressing these challenges. Universities should integrate AI literacy programs, digital communication training, multilingual academic support, and inclusive technological practices into their educational strategies. Such initiatives may contribute to reducing digital inequalities while simultaneously promoting women's leadership, academic participation, and intellectual empowerment within technologically transformed educational environments.

Overall, the discussion demonstrates that the future role of higher education in the age of artificial intelligence extends beyond technological adaptation. Universities must also function as socially responsible institutions that promote linguistic accessibility, gender inclusion, and equitable digital participation. Sustainable higher education development in the AI era therefore requires a balanced integration of technological innovation, linguistic empowerment, and inclusive educational policy frameworks.

POLICY RECOMMENDATIONS

Based on the findings of this study, several policy recommendations can be proposed to strengthen the role of higher education institutions in promoting women's linguistic and digital competencies in the age of artificial intelligence.

First, universities should integrate AI literacy and digital competency development into academic curricula across disciplines rather than limiting such training to technology-related fields. Women students and researchers from humanities, social sciences, and language education programs should also have equitable access to AI-related educational opportunities. This approach would contribute to reducing gender disparities in digital participation and technological confidence (OECD, 2021).

Second, higher education institutions should strengthen multilingual and linguistically inclusive educational policies. Since language proficiency significantly influences access to global academic communication and AI-mediated educational platforms, universities should provide additional academic language support, international communication training, and English for Academic Purposes (EAP) programs, particularly for women learners and early-career researchers (Bourdieu, 1991). Expanding access to multilingual digital resources may also help reduce linguistic inequality in global higher education environments.

Third, universities should develop gender-responsive digital transformation strategies. Institutional policies related to artificial intelligence, digital learning, and technological modernization should explicitly address women's inclusion, participation, and academic visibility. This includes ensuring equitable access to digital infrastructure, online learning platforms, research technologies, and AI-supported educational systems (UNESCO, 2023).

Fourth, higher education institutions should promote women's academic visibility through international collaboration and digital scholarly engagement. Universities may support women

researchers by providing opportunities for participation in international conferences, academic publishing workshops, digital networking platforms, and AI-assisted research environments. Such initiatives can enhance women's representation in global academic discourse and strengthen their professional competitiveness.

Fifth, policymakers and university administrations should encourage interdisciplinary educational models combining language education, digital literacy, and AI competence development. Contemporary educational systems increasingly require integrated competencies rather than isolated technical knowledge. Therefore, higher education reforms should support curricula that combine linguistic communication skills, critical digital thinking, and responsible engagement with artificial intelligence technologies (Ng et al., 2021).

Finally, higher education policies should prioritize inclusive and sustainable educational development in the AI era. Technological innovation alone cannot ensure educational equality. Universities must therefore balance digital transformation with social inclusion, linguistic accessibility, and gender equity. Long-term educational strategies should focus on creating supportive academic ecosystems where women are empowered not only as learners, but also as active contributors to global knowledge production and digital innovation.

Implementation of these policy recommendations may contribute to reducing digital and linguistic inequalities while strengthening women's academic participation, visibility, and leadership in contemporary higher education systems shaped by artificial intelligence.

PRACTICAL RECOMMENDATIONS FOR HIGHER EDUCATION INSTITUTIONS

In response to the growing influence of artificial intelligence on global education systems, higher education institutions should adopt practical and sustainable strategies aimed at strengthening women's linguistic and digital competencies. The effectiveness of educational transformation in the AI era increasingly depends on how successfully universities combine technological innovation with inclusive academic development.

One practical recommendation is the establishment of AI literacy centers and digital competency training programs specifically designed to support women students and early-career researchers. Such initiatives may provide training in AI-assisted academic writing, digital research tools, online scholarly communication, academic publishing platforms, and responsible use of artificial intelligence technologies. Expanding access to these competencies may help women strengthen their academic visibility and professional competitiveness within international educational environments (Ng et al., 2021).

Higher education institutions should also strengthen multilingual academic support systems. Since linguistic competence significantly affects access to international scholarship and AI-mediated academic communication, universities may introduce specialized programs in English for Academic Purposes (EAP), academic writing, research communication, and multilingual digital literacy. These programs can help women learners and researchers participate more actively in international conferences, publications, and global research collaboration (Bourdieu, 1991).

Another important recommendation involves integrating gender-responsive approaches into university digital transformation policies. Institutional strategies related to educational technology and artificial intelligence should explicitly consider issues of gender equity, accessibility, and inclusion. Universities should ensure equal access to digital infrastructure, online

educational resources, AI-supported platforms, and technological training opportunities for women across different academic disciplines (UNESCO, 2023).

Furthermore, universities should encourage interdisciplinary learning environments that combine language education, digital competence development, and AI-related knowledge. Contemporary educational systems increasingly require graduates who are capable of critical communication, technological adaptation, and intercultural interaction simultaneously. Therefore, interdisciplinary curricula may better prepare women for participation in global academic and professional ecosystems shaped by artificial intelligence.

The study also recommends strengthening international academic cooperation and mentorship opportunities for women researchers. Participation in international mobility programs, collaborative digital projects, virtual academic networks, and AI-related research initiatives may contribute to increasing women's academic confidence, leadership, and global scholarly engagement.

Finally, higher education institutions should promote ethical and inclusive approaches to artificial intelligence in education. Universities must encourage critical awareness regarding algorithmic bias, digital inequality, linguistic exclusion, and ethical challenges associated with AI technologies. Such educational practices are essential for ensuring that technological transformation contributes to equitable and socially responsible educational development.

Overall, practical implementation of these recommendations may contribute to creating more inclusive higher education systems where women are empowered through linguistic competence, digital literacy, and equitable participation in AI-driven academic environments.

CONCLUSION

The rapid advancement of artificial intelligence is fundamentally reshaping the landscape of contemporary higher education, creating new opportunities as well as new forms of inequality within global academic systems. In this context, higher education institutions are increasingly expected not only to integrate technological innovation into teaching and research, but also to ensure inclusive, equitable, and sustainable educational development.

This study has demonstrated that women's academic participation and visibility in the age of artificial intelligence are closely connected to the development of linguistic and digital competencies. In AI-driven educational environments, linguistic competence functions as a strategic form of academic capital that influences access to international scholarly communication, digital research platforms, global collaboration, and academic recognition (Bourdieu, 1991). Simultaneously, digital literacy and AI-related competencies have become essential requirements for meaningful participation in contemporary higher education systems.

The findings further reveal that technological transformation alone cannot eliminate existing educational inequalities. Women in Central Asia and other multilingual, developing educational contexts may continue to experience barriers associated with linguistic inequality, limited digital access, insufficient institutional support, and reduced participation in AI-mediated academic environments (UNESCO, 2023). Consequently, the future sustainability of higher education depends not solely on technological modernization, but also on the extent to which universities promote linguistic accessibility, gender inclusion, and equitable digital participation.

The study also emphasizes that higher education institutions play a transformative role in shaping inclusive academic ecosystems. Universities should therefore integrate gender-responsive

educational policies, multilingual academic support, AI literacy programs, and equitable digital strategies into their institutional development frameworks. Such approaches may contribute to strengthening women's academic visibility, professional competitiveness, and participation in global knowledge production.

Moreover, the research highlights the growing interconnection between language, technology, and academic power in the digital era. Artificial intelligence increasingly mediates educational communication, scholarly visibility, and access to academic resources. As a result, women's linguistic and digital empowerment should be recognized as a strategic priority within contemporary higher education reforms and international educational policy agendas.

Overall, this study contributes to current scholarly discussions by demonstrating that the role of higher education in the age of artificial intelligence extends beyond technological adaptation. Universities must also function as socially responsible institutions that promote women's empowerment, linguistic inclusion, and equitable participation in digitally transformed academic environments. Sustainable higher education development in the twenty-first century therefore requires a balanced integration of artificial intelligence, gender equity, linguistic accessibility, and inclusive educational policy.

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