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Digital Participation to AI Competence: Challenges for Equitable GenAI Adoption in Mexican Higher Education

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ABSTRACT
This study examines whether existing digital skills in Mexico provide the conditions necessary for the meaningful adoption of Generative Artificial Intelligence (GenAI) in higher education. Using a descriptive and exploratory approach, the study analyzes data from the 2024 National Survey on the Availability and Use of Information Technologies in Households (ENDUTIH) and contextualizes these findings with recent evidence from the Digital Education Council's Survey on AI in Higher Education in Latin America 2026. The analysis focuses on patterns of digital participation, including communication, information searching, educational use of the internet, and more specialized digital activities, as well as differences in internet use across age groups. The findings show that digital participation is widespread in Mexico, particularly in communication, information searching, and educational activities, while more specialized forms of digital engagement remain considerably less common. At the same time, evidence from higher education in Latin America indicates widespread GenAI adoption alongside important gaps in AI understanding and the critical evaluation of AI-generated content. Taken together, the findings suggest that digital access and participation should not be considered equivalent to digital or AI competence. Meaningful and equitable GenAI adoption in higher education therefore depends not only on access to digital technologies, but also on the development of digital skills and AI literacy.

KEYWORDS Digital skills; Generative artificial intelligence; AI literacy; Higher education; Digital inequality; Mexico.

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Introduction

The rapid expansion of Generative Artificial Intelligence (GenAI) is transforming how information is accessed, produced, and used in educational contexts. In this study, AI is used as a broad term when referring to artificial intelligence generally or to terminology used by the source data, while GenAI specifically refers to generative artificial intelligence systems that produce content such as text, images, or other outputs. The analysis focuses specifically on GenAI adoption in higher education. Tools such as ChatGPT, Gemini, and Copilot are increasingly incorporated into academic practices, supporting information retrieval, writing, problem-solving, research, and content generation [1]. In higher education, these technologies create new opportunities for learning and knowledge production while raising questions about

accessibility, responsible use, and educational inequality [2], [3].

However, access to digital technologies and the skills required to use them effectively are not equally distributed. Having an internet connection or digital device does not necessarily imply the competencies needed to navigate digital environments, evaluate information, or use emerging technologies meaningfully. This distinction becomes particularly relevant with GenAI, whose effective use requires users to formulate queries, evaluate generated information, identify potential errors or biases, and make informed decisions about its application.

Evidence from Mexico illustrates these differences. Data from the 2024 National Survey on the Availability and Use of Information Technologies in Households (ENDUTIH) [4] show that while basic digital activities are widespread among internet users, more specialized digital activities are considerably less common. Communication services are used by 93.0% and information searching by 88.2%, compared with 37.3% who report downloading software or applications and 35.8% who report buying products or services online. At the same time, 81.3% report using the internet for educational or training purposes, highlighting the importance of digital environments in learning.

These conditions acquire greater significance as higher education moves toward increasingly AI-mediated learning environments. The Digital Education Council's Survey on AI in Higher Education in Latin America 2026 reports that 92% of surveyed students have used or currently use AI in their learning. However, high adoption coexists with important gaps in AI literacy: 45% of students report only a basic level of understanding of AI, while more than half report difficulties in critically evaluating AI-generated content.

Against this background, this paper asks:

What do existing patterns of digital participation and selected digital activities in Mexico suggest about the conditions for meaningful GenAI adoption in higher education?

The study examines patterns of digital participation and selected digital activities using ENDUTIH 2024 and contrasts these findings with recent evidence on AI use and literacy among higher education students in Latin America. It argues that digital access alone does not constitute readiness for GenAI; meaningful and equitable adoption also requires the development of digital and AI-specific competencies.

Conceptual Framework: From Digital Inequality to AI Literacy

The concept of the digital divide has evolved as digital technologies have become increasingly embedded in educational, economic, and social life. Early approaches focused primarily on differences in access to technological infrastructure and connectivity. However, access alone provides an incomplete explanation of how individuals benefit from digital technologies. Digital inequalities can also emerge from differences in skills, patterns of use, and the capacity to translate technological resources into meaningful educational and social opportunities [3], [5]. Thus, digital inclusion should be understood not only in terms of whether people can connect to digital environments, but also in terms of what they are able to do once connected.

This distinction is particularly relevant in the context of GenAI. Effective interaction with systems such as ChatGPT, Gemini, and Copilot requires more than access to an AI platform. Users must formulate appropriate instructions, interpret generated information, evaluate its reliability, recognize potential inaccuracies or biases, and make informed decisions about how AI-generated content should be used. UNESCO's guidance [2] therefore emphasizes that the integration of GenAI into education should promote inclusion, equity, human agency, and responsible use rather than assume that technological availability will automatically produce educational benefits.

Recent research in higher education further supports the distinction between AI adoption and AI literacy. Beckman et al. [8] identify different profiles of university students according to their knowledge, confidence, and intended use of GenAI, highlighting the relevance of existing digital inequalities to the emerging "GenAI divide." Similarly, Wang, Bai, and An [9] identify a knowledge-practice gap in AI literacy among college students, suggesting that frequent interaction with GenAI does not necessarily translate into the competencies required for responsible and effective use. These findings indicate that familiarity or frequency of use should not be treated as equivalent to AI literacy.

Based on this literature, this study conceptualizes the relationship between digital skills and GenAI adoption through three analytically distinct dimensions: digital access, digital skills, and AI literacy. Digital access refers to the material conditions required to participate in digital environments, including connectivity and access to appropriate devices [3]. Digital skills refer to the competencies required to perform increasingly complex activities using digital technologies [6]. AI literacy represents a further level of capability involving the understanding, critical evaluation, and responsible use of AI systems [8]. In this study, meaningful GenAI adoption refers to the ability to engage with generative AI in ways that involve purposeful use, critical evaluation of AI-generated outputs, recognition of potential inaccuracies or biases, and informed decisions about how generated content is incorporated into educational activities. This concept is treated as an analytical framework rather than as a directly measured outcome in the datasets used in this study.

This framework allows ENDUTIH 2024 indicators to be interpreted as contextual indicators of digital participation that may be relevant to the conditions for GenAI adoption, rather than as direct measures of AI use or readiness. ENDUTIH does not measure whether respondents use ChatGPT, Gemini, or other GenAI systems; instead, it provides evidence on the distribution of digital access and patterns of digital participation in Mexico. The study therefore does not assume that individuals with stronger digital skills necessarily use AI. Rather, it examines whether the digital conditions that may facilitate AI adoption are themselves unevenly distributed. To complement this analysis, evidence from the Digital Education Council's Survey on AI in Higher Education in Latin America 2026 is used to contextualize these conditions alongside recent evidence on AI use and AI literacy among higher education populations in the region.

Accordingly, this study argues that access to digital technologies should be considered an important starting point for GenAI adoption, but not a sufficient condition for its effective use. The development of digital skills and AI literacy may influence how individuals engage with these technologies, particularly in educational settings. This perspective provides the basis for examining whether existing differences in digital skills in Mexico may represent an important consideration for the equitable incorporation of GenAI into higher education.

Data and Methods

This study uses a descriptive and exploratory approach based on two complementary sources. The first is the 2024 National

Survey on the Availability and Use of Information Technologies in Households (ENDUTIH), conducted by the National Institute of Statistics and Geography (INEGI). ENDUTIH provides nationally representative information on access to and use of information and communication technologies in Mexico.

The analysis focuses on indicators of digital participation and internet use, including information searching, online communication, downloading software or applications, buying products or services online, and educational uses of the internet. These indicators capture different forms of engagement with digital technologies, allowing us to distinguish between more common and more specialized forms of digital participation while providing only indirect evidence about the digital skills that may support these activities. Additional information on age, educational attainment, socioeconomic conditions, and access to digital devices is used to contextualize differences in digital capabilities.

The analysis is descriptive and does not seek to estimate a causal relationship between digital skills and GenAI adoption. This distinction is important because ENDUTIH 2024 does not directly measure the use of GenAI applications such as ChatGPT, Gemini, or Copilot. Its indicators are therefore interpreted as conditions that may facilitate or constrain participation in increasingly digital and AI-mediated environments, rather than as direct measures of AI adoption or AI literacy.

These sources address different populations and research purposes. ENDUTIH provides nationally representative evidence for the Mexican population and includes indicators of internet use and digital activities, but it does not specifically target higher education students or measure GenAI use. In contrast, the Digital Education Council survey focuses specifically on higher education and GenAI, but its participating institutions are distributed across Latin American countries and do not provide a Mexico-specific estimate. The two sources are therefore used as complementary evidence rather than as directly comparable measures of the same population.

The second source is the Digital Education Council's Survey on AI in Higher Education in Latin America 2026. The survey collected responses from 22,941 students and 7,319 faculty members across 29 higher education institutions in Latin America and provides information on AI use, adoption patterns, and AI literacy among students and faculty.

The two sources are not statistically combined. Instead, the DEC survey is used to contextualize and contrast the findings from ENDUTIH with recent evidence on the use and understanding of AI in higher education. The analysis first describes patterns of digital participation and selected digital activities in Mexico and then considers how these patterns relate to the competencies increasingly required to engage with GenAI in educational settings.

This approach allows us to examine whether widespread digital participation necessarily implies readiness to use GenAI effectively.

Results

Digital activities and educational use

The ENDUTIH 2024 data reveal a marked differentiation in the intensity and type of digital participation among internet users in Mexico. Communication is the most widespread activity, reported by 93.0% of users, followed by information searching (88.2%) and educational or training activities (81.3%). In contrast, substantially smaller proportions report downloading software or applications (37.3%) or buying products and services online (35.8%) (Fig. 1).

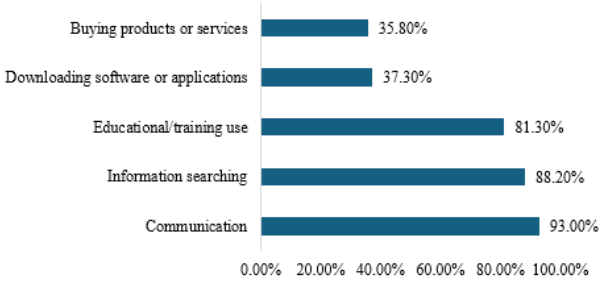


Fig. 1 Selected digital activities and internet uses among internet users in Mexico, 2024. Data from [4].

The distribution reveals a substantial gap between widespread forms of digital participation and activities that involve more specialized interaction with digital technologies. The difference between communication and online purchasing alone is 57.2 percentage points, while educational use remains considerably closer to communication and information searching than to the more specialized activities.

This pattern is relevant to the study because it suggests that digital participation in Mexico is not a uniform phenomenon. Individuals may be highly active in digital environments without necessarily engaging in the broader range of activities that characterize more intensive or diversified technology use. Educational use is particularly relevant in this respect: although 81.3% of internet users report using the internet for education or training, this figure does not indicate whether users possess the competencies required to evaluate, produce, or transform digital information.

Age differences in digital participation

Digital participation also varies substantially across age groups. Internet use is particularly high among younger populations, reaching 97.0% among people aged 18–24 and 95.1% among those aged 25–34. The proportion remains above 90% among people aged 35–44 (92.3%), but declines to 83.8% among those aged 45–54 and 71.0% among those aged 55–64. Among people aged 65 and over, internet use falls to 42.1% (Fig. 2).

The distribution shows that internet participation remains high across younger and middle-aged groups but declines sharply among the oldest population. The difference between the youngest and oldest groups reaches 54.9 percentage points. This pattern indicates that digital participation remains strongly differentiated by age, even within a context of widespread internet use.

Digital activities in the context of GenAI

The ENDUTIH findings can be considered alongside recent evidence on AI use in higher education. The Digital Education Council's Survey on AI in Higher Education in Latin America 2026 reports that 92% of surveyed students have used or currently use AI in their learning, while 67% of AI users report using these tools daily or weekly. At the same time, 45% of students remain at basic stages of AI understanding, and more than half report difficulties in critically evaluating AI-generated content.

The contrast between these findings is particularly relevant. ENDUTIH shows that digital participation is already widespread in Mexico, with high levels of communication, information searching, and educational use of the internet. However, participation in other digital activities is considerably lower. The Digital Education Council survey, meanwhile,

shows that GenAI has rapidly entered higher education practices in Latin America, even as important differences remain in students' understanding and critical evaluation of AI-generated content.

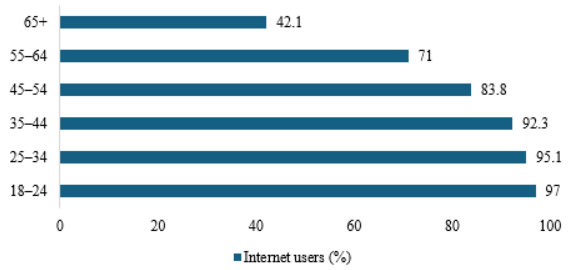


Fig. 2 Internet users by age group in Mexico, 2024 Data from [4].

Taken together, these findings suggest that high levels of digital participation and high levels of AI adoption do not necessarily imply equivalent levels of digital or AI competence. The Mexican data provide a broader picture of the digital environment in which emerging technologies are being introduced, while the Latin American higher education evidence illustrates the extent to which AI is already being incorporated into academic practices.

Because the two sources differ in population, sampling design, geographic scope, and objectives, their findings are not treated as a statistical association. Rather, the comparison provides complementary evidence for exploring what existing patterns of digital participation in Mexico may suggest about the conditions for meaningful GenAI adoption in higher education. The findings are therefore interpreted in light of this broader question.

Discussion

The results suggest that the relationship between digital participation, digital skills, and GenAI adoption in higher education cannot be understood simply as a question of technological access. ENDUTIH 2024 shows that digital participation is widespread in Mexico, particularly in communication, information searching, and educational uses of the internet. However, participation in other potentially advanced digital activities is considerably less common. This distinction is consistent with broader approaches to digital equity, which emphasize that inequalities persist not only in access to technology but also in the ability to use digital resources effectively and meaningfully [3], [4], [10]. Access is therefore necessary for digital participation, but it should not be assumed to produce advanced digital competence.

This distinction becomes particularly relevant with GenAI. Effective interaction with AI systems requires users to formulate requests, interpret outputs, assess information quality, identify potential inaccuracies, and make informed decisions about the use of generated content. Digital skills can therefore provide an important foundation for AI literacy, although the two should not be treated as equivalent [10], [11]. The educational challenge is thus to help students progress from technological use toward more critical and purposeful engagement with digital tools.

The contrast with the Digital Education Council's 2026 evidence further illustrates this distinction. AI use among higher education students in Latin America is already widespread, with 92% of surveyed students reporting that they have used or currently use GenAI in their learning. At the same time, 45% remain at basic stages of GenAI understanding, while more than half experience difficulties critically evaluating AI-generated content. Although these data cannot establish that frequent use leads to competence, the coexistence of widespread adoption and uneven AI literacy is consistent with the distinction identified in the conceptual framework between AI use and AI literacy [8], and shows that access and use should not be treated as indicators of competence.

From an equity perspective, this finding has important implications for higher education institutions. Providing access to AI platforms or technological infrastructure may not be sufficient if students have different levels of digital competence. Higher education institutions can play a pivotal role by transforming students' exposure to digital technologies into opportunities to develop more advanced forms of competence. Institutional strategies should therefore address not only access, but also the development of the skills needed to use AI critically and effectively. Digital literacy initiatives, AI literacy training, academic guidance, and learning activities requiring students to evaluate AI-generated information could form part of a broader strategy for equitable AI integration. This approach is consistent with the emphasis placed by Miao and Holmes [2] on inclusion, equity, human agency, and responsible use in the integration of GenAI into education.

At the institutional level, these findings suggest several practical areas for action. Higher education institutions can incorporate AI literacy activities into existing curricula, provide guidance on evaluating AI-generated information, and develop institutional resources that support responsible use of GenAI in academic work. Institutions can also offer differentiated training according to students' previous levels of digital experience, rather than assuming a homogeneous level of digital competence. These measures can help translate access to AI technologies into more critical and purposeful academic engagement.

The results also contribute to the emerging discussion of a "GenAI divide" in higher education. Beckman et al. [8] identify differences in students' knowledge, confidence, and intended use of GenAI that reflect broader patterns of digital inequality. From this perspective, the relevant issue is not simply whether students can access GenAI, but whether they have the capacities to turn that access into meaningful academic use. GenAI adoption may therefore advance without producing equivalent levels of AI literacy, potentially creating a new dimension of inequality within higher education.

In emerging economies, the role of institutions is demanding and challenging. Beyond broadening access to intelligent tools, higher education institutions must create educational conditions for mobilizing students from digital consumption toward critical evaluation, knowledge creation, and responsible participation.

The comparison presented here has important source-specific limitations. ENDUTIH 2024 provides nationally representative evidence on digital access and selected internet activities in Mexico, but it does not directly measure GenAI use or AI literacy. Its indicators therefore cannot establish whether individuals with stronger digital skills actually adopt GenAI or use it more effectively. In addition, the survey indicators used in this study capture selected forms of digital participation and do not provide a comprehensive measure of digital competence.

The Digital Education Council survey also has important limitations. Its findings are based on participating higher education institutions and should not be interpreted as representative of all higher education students in Latin America or of the Mexican higher education population. Moreover, the survey focuses specifically on AI use, adoption

patterns, and AI literacy, which makes its measures conceptually different from the digital participation indicators available in ENDUTIH. The two sources therefore cannot be statistically combined or used to establish a causal relationship. Their value in this study is complementary: ENDUTIH provides evidence on the broader digital conditions in Mexico, while the Digital Education Council survey provides contextual evidence on GenAI use and AI literacy in higher education.

Taken together, these findings can be interpreted as supporting a broader conception of digital inclusion in higher education. Access remains necessary, but it is insufficient if students lack the capacities to critically evaluate outcomes, create with, and make responsible use of GenAI. The challenge for higher education institutions is demanding; it is not only to ensure that students can access GenAI, but also to ensure that they can understand, evaluate, and use it meaningfully. This shifts the focus from technological availability alone toward the educational processes that enable students to benefit from GenAI and other emerging AI technologies.

Conclusions

The findings suggest that digital competence may constitute an important enabling condition for meaningful GenAI adoption in higher education; however, access and basic digital participation alone should not be assumed to indicate readiness for effective AI use. ENDUTIH 2024 shows that digital engagement is widespread in Mexico, particularly in communication, information searching, and educational activities, while more specialized digital activities remain considerably less common. This indicates that digital participation does not necessarily translate into the capacities required to engage effectively with increasingly complex technologies.

The comparison with recent evidence from higher education in Latin America reinforces this distinction. Although AI use among surveyed university students is already widespread, important gaps remain in AI understanding and critical evaluation. The expansion of GenAI may therefore be advancing faster than the development of the competencies required for its responsible and critical use.

The main contribution of this study is to distinguish between digital access, digital skills, AI literacy, and AI adoption. These dimensions are related but should not be treated as interchangeable. Access provides the conditions for participation, digital skills support the effective use of digital environments, and AI literacy involves the ability to understand, evaluate, and critically engage with AI systems and their outputs.

For higher education institutions, this means that equitable AI integration should extend beyond providing access to platforms and technological infrastructure. Institutional strategies should also strengthen digital and AI literacy, particularly among students with different levels of previous technological experience. Developing critical evaluation skills and the ability to make informed decisions about GenAI use should therefore become part of broader strategies for AI integration in higher education.

Finally, this study is limited by the fact that ENDUTIH 2024 does not directly measure GenAI adoption or AI literacy. The relationship identified here should therefore be understood as an analytical proposition rather than a causal finding. Future research should combine nationally representative measures of digital skills with specific data on GenAI use and literacy among university students in Mexico. Such research could help determine whether existing digital inequalities are reproduced in the emerging GenAI landscape and identify institutional strategies that can support a more equitable adoption of intelligent technologies.

AI Use Disclosure

During the preparation of this work, the authors used OpenAI's ChatGPT for translation and language editing. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

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