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Review Article

Generative AI for Enhancing Accessibility and Inclusion in Higher Education: A Systematic Review

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Abstract

This study reviews existing literature on generative artificial intelligence (AI) and its accessibility for students with visual, hearing, and motor disabilities in higher education. The objective is to identify gaps in the implementation of inclusive education practices. The PRISMA protocol guided the review process, and the Scopus and Web of Science databases were selected for their recognized academic rigor and comprehensive coverage. The first phase involved the review of 54 articles in English from 2023 to 2024. The selection process involved prioritizing articles based on empirical scientific studies on AI applications for students with disabilities, and discarding articles that did not meet the criteria. Ultimately, only five articles were selected. The findings reveal a significant research gap regarding the role of generative AI in supporting these students. Notably, the selected articles tend to focus more on sensory disabilities than on motor disabilities. This study is pioneering in pointing out the lack of research on motor disabilities during the analyzed period, a key aspect of AI in higher education. These findings underscore the necessity of further research that aligns with the UN 2030 Agenda, specifically Goals 4 (Quality Education) and 10 (Reduced Inequalities), promoting the development of AI tools that foster equal opportunities and inclusive education.

Keywords: Generative Artificial Intelligence; Accessibility; Higher Education; Educational Inclusion; Adaptive Technologies.

1. Introduction

Artificial intelligence (AI) has established itself as a transformative tool in higher education, with significant advances in accessibility since the widespread adoption of generative AI tools, such as ChatGPT, in late 2022 [1]. Generative AI, which creates content such as text, images, and audio based on user prompts, enables personalized learning environments by adapting curricula and improving feedback systems [2, 3]. However, despite its rapid spread in education and the studies conducted, between 2023 and 2024 there were still few studies addressing equitable access for students with disabilities, especially those with sensory (visual and hearing) and motor impairments [4]. This gap is crucial as international bodies grant the right to equitable education, as established by the United Nations Convention on the Rights of Persons with Disabilities [5] and align with the Sustainable Development Goals (SDGs), specifically SDG 4 (Quality Education) and SDG 10 (Reduced Inequalities) [6, 7].

Recent research on generative artificial intelligence in education has addressed various topics, such as pedagogical applications and integration in higher education [8-11], but often overlooks accessibility for students with sensory and motor disabilities [4]. Other studies have been conducted by Ahmed et al. (2024), who focus on students' perspectives

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and opinions on the use of AI in learning, but do not take into account the accessibility barriers faced by students with visual, hearing, and motor disabilities, such as lack of compatibility with screen readers, absence of automatic subtitles, or lack of voice controls for navigation in these digital tools [9]. Similarly, Krause et al. (2024) highlight the potential of AI but do not address inclusive design for motor disabilities [12]. This gap is also observed in studies such as those by Ashtikar et al. and Nikolopoulou, which mention audio support for visual disabilities but do not consider specific adaptations for motor disabilities [13, 14]. Although some AI applications comply with standards such as WCAG 2.2 for accessibility [15], the lack of attention to motor disabilities in studies reflects a gap in research that could exacerbate educational inequalities [13]. Although some AI applications comply with standards such as WCAG 2.2 [15], this lack of attention to motor disabilities in the literature points to an important gap that may increase educational inequalities [13].

To address this gap, the present study conducts a systematic review of the literature published between 2023 and 2024, with the aim of assessing the extent to which the inclusion of sensory (visual and hearing) and motor disabilities has been considered in research on generative artificial intelligence in higher education. It also analyzes the accessibility barriers faced by students with these disabilities, including technological limitations, as well as economic and linguistic barriers that could hinder their equitable access to these tools [16]. This work is based on a theoretical framework that integrates Universal Design for Learning (UDL), Hyatt & Owenz [17], because reducing barriers to learning, whether physical, cognitive, affective, or institutional, as well as creating flexible and accessible learning experiences for all students, with the aim of providing them with equal opportunities, is a perspective based on human rights and the SDGs [5, 6, 7, 17].

The structure of the chapters in this paper is as follows: Section 1 introduces the topic and research gaps. Section 2 reviews the literature. Section 3 outlines the methodology. Section 4 conducts a systematic review. Section 5 examines the results. Section 6 provides conclusions. Section 7 includes declarations. Section 8 lists references.

2. Literature Review

2.1. IA Generative

Generative artificial intelligence represents an advance from traditional AI, which focuses on decision-making based on specific inputs [1]. The term "generative" refers to AI's ability to produce novel results rather than simply reproducing, categorizing, processing, or analyzing inputs [3]. Traditional AI can suggest a course based on user preferences, whereas generative AI can generate content such as videos, text, images, music, or a combination of these [1, 15, 18, 19]. Therefore, generative AI produces content based on user prompts [20]. Hyatt & Owenz [17] considered the use of generative AI in creating content adapted to different formats and styles. In addition, AI applications can support students with disabilities by providing personalized learning materials and tools that are tailored to their specific needs [21-23]. Additionally, AI applications can support students with disabilities by providing personalized learning materials and tools tailored to their specific needs. Emerging practices include captioning for deaf and hard-of-hearing students and audio descriptions for visually impaired students. However, this feature has yet to be utilized on a large scale [24].

These authors point out that generative artificial intelligence tools are already available to personalize learning materials for students with disabilities. However, challenges remain as these tools have not yet been fully designed and adapted for accessibility. The next section will address the use of generative AI in higher education.

2.2. Generative AI in Higher Education

Artificial intelligence (AI) has proven to be a useful learning technology in higher education. It can help students achieve positive learning outcomes and allow teachers to better understand their students' learning status, further improving their teaching strategies [25]. AI can enhance personalized learning experiences and streamline educational processes [26], as well as provide teachers with relevant information about learners' characteristics and learning status. This allows teachers to assist learners in a timely manner, which is why AI has become a relevant topic in higher education [27, 28]. AI's ability to "generate" novel content allows it to create new results [3]. One difference between AI and generative artificial intelligence is that the latter is broader. It creates new, original content not found in your training data [29]. This system customizes learning materials according to each student's needs and progress. It generates video lessons accompanied by visual support, such as images and animations, to facilitate understanding of complex concepts.

Ashtikar et al. [13] explore how AI tools generate adaptive content, such as videos and text, to support diverse learners. For instance, videos with subtitles enhance the comprehension of theoretical content among students with and without visual or motor impairments. One example is the "Be My Eyes Virtual Volunteer" service, which allows users to send images through the app to an AI-powered "virtual volunteer" that can answer questions about the image and provide immediate visual assistance with various tasks [30].

2.3. Accessibility in Higher Education

The term "accessibility" refers to the degree to which environments, services, or products allow access to as many people as possible, including those with disabilities. Environments can hinder or enable participation and access to information and communication technologies (ICTs) [5]. For the purposes of this review, generative AI is defined as tools that create new content based on prompts, such as text generators, image generators, video generators, text-to-speech tools, 3D visual generators, game generators, and code generators [31]. Examples of generative AI include ChatGPT and GPT-4 for text and code generation, Copilot for code generation, Midjourney and DALL-E for image creation, and Voicebox for text-to-speech [31].

Digital accessibility means that people with and without disabilities can obtain equivalent experiences and opportunities from digital content. Teach Access (2025) [32]. Accessibility also means access to computers, adapted keyboards, the internet, and overcoming socio-economic (e.g., limited resources) and linguistic (e.g., non-native students) barriers. Students may also encounter material that is not designed for people with disabilities or specialized software (e.g., voice control for people with disabilities). All of this can create inclusive gaps for students in this situation. Therefore, an inclusive approach recommended by the principles of Universal Design for Learning (UDL) is necessary [31, 32].

Developing accessible technologies is important to ensure that people with disabilities can participate in educational and professional settings. For example, the use of artificial intelligence in education can be a powerful tool for creating inclusive learning environments and providing feedback. However, it is crucial to guarantee that these technologies are accessible to all, including students with visual, hearing, or motor impairments [5]. Education is a right that must be guaranteed to everyone, regardless of their personal characteristics or conditions. This requires structural reforms and measures that promote equal opportunities and equity. Universities must address this challenge and ensure that environments are accessible to students, among other things [33]. One of the challenges higher education institutions face is integrating these technological tools into their curricula. Additionally, teachers must be trained to incorporate these tools into their learning activities and educational projects according to the subject and objectives to be developed. In this context, Alshahrani [34] suggests that artificial intelligence has emerged as a possible solution to improve educational accessibility.

Schauer et al. (2025) demonstrated that AI-powered screen readers can improve online learning for students with visual impairments but note their limited effectiveness for those with motor impairments [35]. Similarly, Glazko et al. (2024) highlight generative AI's potential to promote accessibility. However, they caution that poorly designed tools can exacerbate inequalities, particularly among students with motor disabilities [36]. Zapata Marín (2024) examined 150 students with cognitive, sensory, and motor disabilities and found that while generative AI tools such as ChatGPT support academic performance and motivation, students face barriers such as inaccessible user interfaces, particularly for motor impairments [37]. The latter barrier coincides with the findings of Pierrès et al. (2024), who interviewed 33 students in Switzerland and reported similar problems with assistive technology compatibility [38]. Although Zapata's study is larger (n=150) than Pierrès's (n=33), more research is needed to obtain more robust results that address motor disability. Chemnad and Othman (2023) analyzed 43 studies from 2018 to 2023 and found that there was a predominant emphasis on visual disabilities and a significant gap in research on motor disabilities [39]. These findings demonstrate the need for more studies focused on motor disabilities.

These gaps in motor disability research align with United Nations Sustainable Development Goal 10 (reduce inequalities) [6] and highlight the need for this systematic review to explore how generative AI can improve accessibility for students with sensory and motor disabilities in higher education.

2.4. Accessibility in Higher Education

The accelerated growth of generative AI over the past year has prompted many universities to adopt various strategies to address the challenges facing higher education [40]. Despite its potential benefits, Roegiest & Pinkosova [41] emphasize the importance of addressing the readability and accessibility barriers posed by generative information systems, particularly for individuals with literacy challenges. Therefore, while recognizing the limitations and concerns of equity and accessibility, generative AI systems offer benefits but also risks for students, teachers, and administrators [15]. These systems are progressively integrating into our daily routines and could reshape the way we access, process, and produce information [41]. For example, the costs associated with generative AI tools, such as subscription fees for platforms such as ChatGPT and Midjourney, to name two examples, create economic barriers that mainly affect students with disabilities.

These students rely on expensive assistive technologies, a problem identified by Garcia Ramos and Wilson-Kennedy and Alasadi & Baiz [42, 43]. Furthermore, the digital divide—evidenced by limited access to high-speed internet or compatible devices—further restricts access for low-income students with disabilities, a concern highlighted by Acosta-Vargas et al. and Baidoo-Anu et al. [15, 44].

To understand the need for studies on the characteristics of people with disabilities, it is important to note that students enrolling in educational institutions may or may not explicitly disclose a disability. For example, the National Center for Education Statistics reported that, in the 2019-2020 school year, approximately 21% of undergraduates and 11% of graduates reported having a disability such as severe deafness, blindness, or difficulty seeing [45]. The Association for Access to Higher Education and Disability (AHEAD) has also noted an increase in the number of higher education students participating in disability services over the past eleven years. The number of students with sensory disabilities in the blind/visually impaired category increased from 134 in 2008/09 to 261 in 2019/20—a 95% increase.

The number of deaf/hard of hearing students increased from 206 in 2008/09 to 379 in 2019/20—an increase of 173 students, or 84%. The total number of students with other types of disabilities increased by 226.5% over the same eleven-year period [46]. These data show that it is necessary to address this problem through public policies and by encouraging companies that develop these technologies to create accessible applications that benefit all students, regardless of their grade level. Additionally, educational institutions must pay attention to this issue so that access to and infrastructure for these technological tools are progressively included. This will prepare educational institutions to support students when they enroll. This reduces the barriers for this group of students [46].

This study addresses concerns about accessibility by focusing on how generative AI technologies can enhance academic development and contribute to educational inclusion and improved accessibility in higher education. These technologies can support students' learning styles, such as visual, auditory, and motor learning, and go beyond providing ICT skills. The following section will present the methods that will be used for the development of this project, including the methodology, search strategies, inclusion and exclusion criteria, research questions, and the systematic review process.

3. Research Methodology

- This study focuses on higher education students from all disciplines. Their characteristics and needs may differ from those of students in other degree programs.
- English was chosen as the language of study due to its prevalence in international academic publications.
- This study analyzes literature published between 2023 and 2024. These years were selected because generative AI is an emerging topic, and the aim is to explore research in this field, particularly as it pertains to individuals with sensory and motor disabilities.
- The search was conducted in the Scopus and Web of Science databases.
- The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) systematic review process was followed Yepes-Núñez et al. [47]. The search and selection of documents was carried out step by step: Identification, selection, eligibility, and inclusion.

3.1. Research Questions

This study addresses the following research questions:

- How does generative artificial intelligence adapt to meet the needs of students with disabilities in higher education?
- Have studies on integrative artificial intelligence related to the needs of students with disabilities in higher education been carried out in the educational field?
- Do studies from 2023 and 2024 on student accessibility consider the opinions of students with sensory and motor disabilities?
- In what ways have studies addressed the application of generative artificial intelligence in higher education for students with disabilities?

3.2. Search Strategy

To optimize the article search, the following keywords were used: "Generative AI and Accessibility in Higher Education" or "Generative AI" or "AI Personalization" and "Accessibility in Higher Education" or "Inclusive Educational Practices" or "Assistive Technologies in Education" and "Higher Education" or "College Students."

Two checklists of inclusion criteria were developed to facilitate the identification of articles. Articles were excluded if they did not meet the inclusion criteria described in Table 1. This approach simplified the review process. One of the inclusion criteria was that articles had to comply with the following points: 1, 2, 3, and 4.

Table 1. Inclusion Criteria for Article Selection

1	Articles published between 2023 and 2024.
2	Articles written in English
3	Peer-reviewed publications.
4	Studies based on experimental, quasi-experimental, observational, qualitative research, systematic reviews, and meta-analyses.

In addition, articles had to meet one or more of the inclusion criteria listed in Table 2.

Table 2. Inclusion criteria for the selection of articles

5	Studies focused on university students, including those with disabilities (visual, hearing, motor).
6	Studies investigating the use of generative AI to personalize learning according to students' learning styles (visual, auditory, motor.)
7	Studies exploring the educational inclusion of students with disabilities, including those related to digital accessibility and technological tools in higher education.
8	Studies addressing generative AI in the context of higher education and accessibility.

The inclusion criteria were studies published in 2023 and 2024, in the Scopus and Web of Science databases, in English, peer-reviewed, and addressing the use of generative artificial intelligence tools, such as ChatGPT. Studies employing experimental, quasi-experimental, observational, or qualitative research methodologies, as well as systematic reviews and meta-analyses, were included. The studies had to explore higher education students with visual, auditory, and motor disabilities.

We considered studies that examined using generative AI to personalize learning according to the type of disability, including research focused on digital accessibility and technological tools in higher education and studies that addressed generative artificial intelligence in higher education and accessibility. Articles that did not meet these criteria were not considered for this study.

The review identified 54 studies, 30 of which were excluded during the screening phase as they did not address generative artificial intelligence or disabilities. After re-screening, a further 19 studies were excluded for not meeting the quality or relevance criteria, leaving only five studies that met the inclusion requirements.

For the purposes of this study, cognitive, neurodevelopmental, and learning disabilities (e.g., dyslexia and autism) were excluded from the review to enable a focus on sensory (visual and auditory) and motor disabilities. This decision was made because sensory and motor disabilities are underrepresented compared to cognitive disabilities, as highlighted by Chemnad & Othman [39].

4. Selection and Systematic Review Process

This section presents the steps of the systematic review steps following the PRISMA protocol [47]. It consists of five phases: Identification, Duplicates, Screening, Eligibility, and Inclusion.

Identification**:** The first step was to search for articles in the Scopus and Web of Science databases. The keywords established in Tables 1 and 2 were used for the search, inclusion, and exclusion of articles from other years and reports on other topics. This process was repeated twice to verify that the first and second searches yielded the same results and to avoid bias in the searches.

Duplicates**:** Duplicate items were identified using the Rayyan software, which enables the automated detection of duplicates. First, articles were imported from databases into Rayyan, and the software analyzed them to identify duplicates, considering articles with the same title, authors, and publication details. A manual review was then carried out to confirm the duplicate articles. The articles with the most complete information in the databases were preserved; articles that only mention the title and author were discarded. The searches carried out in Scopus and Web of Science yielded 33 and 21 articles, respectively. A total of 54 academic works were added from both sources of data to continue with the next phase.

Screening**:** Subsequent to the process of duplicate detection and finger cleaning, the next phase was the selection phase, where the review of duplicate articles continued, and the most complete ones were preserved. Preference was given, for example, to articles that included details such as the DOI, abstract, and other relevant information. In this phase, 7 duplicate records were eliminated, leaving a total of 47 for evaluation. Finally, 9 articles were sent to the recovery process.

Eligibility**:** For the final phase of the PRISMA review, the process continued with the eligibility stage. The eligibility of 9 articles was reviewed; only those that met the inclusion criteria were retained. Four articles that did not meet the inclusion criteria were excluded.

Inclusion**:** By the end of this review, five articles had been selected that met the characteristics indicated in the inclusion criteria. Therefore, of the 54 articles initially obtained to represent the research topic, only five remained at the end of the review. This represents just 9.2% of the articles initially shortlisted from the databases.

Figure 1 illustrates the PRISMA systematic review process, including the phases of Identification, Removal of Duplicates, Screening, Eligibility, and Inclusion.

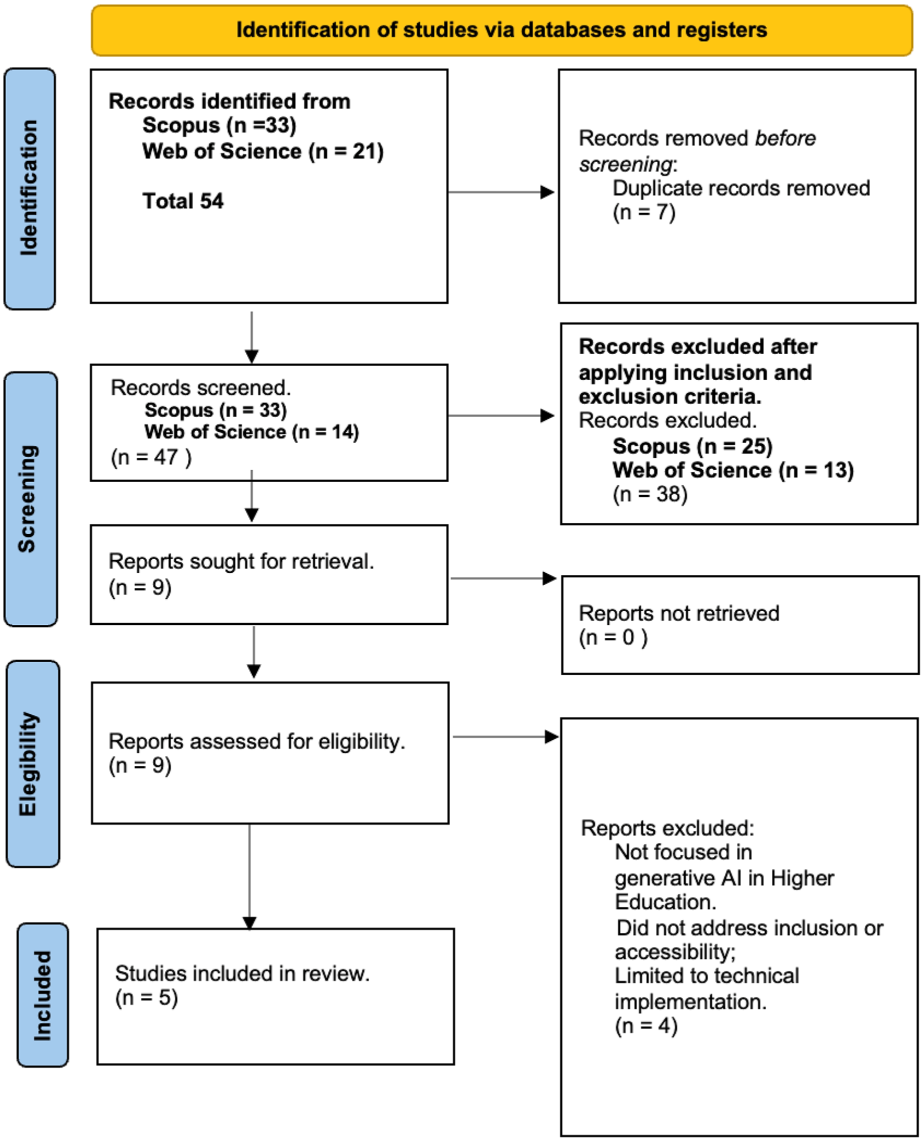

Figure 1. Identification of studies via databases and registers

After the selection and systematic review process had been carried out, a table was created containing information on each selected article, including the title, type of publication, topic, author, journal, year, and country. This information is presented in Table 3.

Table 3. Key characteristics of the articles included in the systematic review

Article Title	Publication Types	Topics	Authors	Journal	Year	Database	Country
Generative AI and Web Accessibility: Towards an Inclusive and Sustainable Future.	Journal Article	Web Accessibility, Inclusion, Sustainability	Acosta-Vargas et al. [15]	Emerging Science Journal	2024	Scopus	Ecuador
Exploring the role of generative AI in higher education: Semi-structured interviews with students with disabilities.	Journal Article	Generative AI, Disabilities, Inclusion	Pierrès et al. [38]	Education and Information Technologies	2024	Scopus	Switzerland
Promoting equity and addressing concerns in teaching and learning with artificial intelligence.	Journal Article	AI integration, equity, inclusive teaching, STEM	Garcia Ramos & Wilson-Kennedy [42]	Frontiers in Education	2024	Scopus	USA
Generative AI in Education and Research: Opportunities, Concerns, and Solutions.	Journal Article	AI Integration, Use of AI ChatGPT, Education, Generative AI, GPT-4, Technology, Tools	Alasadi & Baiz [43]	Journal of Chemical Education	2023	Scopus	USA
Exploring student perspectives on generative AI in higher education learning.	Journal Article	Student Perspectives, Generative AI, Higher Education	Baidoo-Anu et al. [44]	Discover Education	2024	Scopus	Ghana

Although 54 articles were generally relevant to the topic of this study, not all of them met the inclusion criteria. Of these, only five were included in the final selection: two from the United States, one from Ecuador, one from Switzerland and one from Ghana. One of these articles was published in 2023 and the other four in 2024; all were sourced from the Scopus database. Figure 2 shows a map indicating the countries where the selected studies were conducted. This reflects the international interest in research on generative artificial intelligence and its accessibility in higher education.

Figure 2. Countries of the five selected articles

5. Discussion

Artificial Intelligence (AI) has become a widely used tool in various sectors, particularly in education. While AI continues to evolve in terms of the ways in which it can be used and the platforms on which it can be used, there are concerns about its uneven adoption by people with and without physical disabilities, including visual, hearing and motor impairments. Several platforms and tech companies are exploring ways to improve accessibility and become more inclusive of all users. However, not all of these technological tools are currently adapted to the needs of students with sensory or motor disabilities, which hinders their ability to access, manipulate and complete tasks and activities both inside and outside the classroom. For instance, students with hearing impairments face different barriers to those with visual impairments. Integrating a contextual assistant within these tools could enable real-time adjustments to meet specific accessibility requirements [15], implying that limitations may vary from user to user.

An analysis of five key studies shows that tools such as ChatGPT, GPT-4 and RxnScribe can promote inclusive education, but there are still barriers to equity. Access gaps, costs and biases in data disproportionately affect minority students. Meanwhile, accessibility issues relating to visual impairments (e.g., navigation) and language barriers (e.g. for English as a Second Language (ESL) students) hinder inclusion. According to student perspectives, the digital divide further limits equitable access. However, enablers such as alignment with UDL, personalized learning and language support can address the needs of diverse groups, including those with visual impairments and non-native English speakers. This aligns with the project's equity goals. These findings emphasize the importance of implementing policies that ensure equitable access and greater accessibility in AI-powered education.

The literature review conducted for this study, based on digital sources from Scopus and Web of Science from 2023 and 2024, reveals a limited number of studies on the accessibility of generative artificial intelligence in higher education for students with disabilities, particularly hearing, visual and motor impairments. After completing the PRISMA diagram process and selecting the five articles at the end of the methodology, the following became apparent:

A literature review based on sources from Scopus and Web of Science (2023–2024) reveals that there is a limited body of research on the accessibility of generative artificial intelligence in higher education for students with disabilities, particularly those with hearing, visual and motor impairments. After applying the PRISMA process and selecting five studies, significant advances were highlighted, but critical gaps also remained. Acosta-Vargas et al. [15] and Pierrès et al. [38] emphasize the importance of providing accessible formats such as text, subtitles, and audio, as well as intuitive interfaces, and of involving students with physical disabilities in the design, development, and testing of digital tools.

However, like the selected studies, these studies rarely address motor disabilities, limiting their inclusiveness. Similarly, Cruz Argudo et al. [1], which are outside the scope of this review, describe AI tools such as text-to-speech and adaptive platforms that benefit students with visual and cognitive disabilities but do not consider the needs of those with motor disabilities.

This pattern is evident in the work of Ashtikar et al. [13], Nikolopoulou [14] and Zhao et al. [48]. These authors explore adaptive content and sustainable education through mobile and blended learning, as well as the use of AI by students with cognitive disabilities, such as dyslexia. Similarly, Zhao et al. (2025) examine the use of chatbots and rewriting applications for academic writing, while Ashtikar et al. [13] mentioned tools such as audio resources that benefit students with visual impairments. However, they do not delve into specific adaptations or address motor barriers. In line with Chemnad & Othman [39], there is a lack of attention to motor disabilities, highlighting the urgent need to design inclusive tools. These gaps, also evident in studies on equity in AI [13], underscore the need for more comprehensive research to ensure truly inclusive generative AI. Table 4 presents selected studies on generative AI accessibility and inclusion in higher education, with inclusion criteria referenced from Table 2.

Table 4. Selected Studies on Generative AI Accessibility and Inclusion in Higher Education (2023–2024)

Title of the article	Authors and year	Technologies	Barriers (Related to Equity and Inclusion)	Facilitators (Related to Equity and Inclusion)	Type of Disability or Accessibility Addressed	Criterion for Inclusion
Generative Artificial Intelligence and Web Accessibility: Towards an Inclusive and Sustainable Future	Acosta-Vargas et al. [15]	ChatGPT, Copilot, Midjourney, etc.	Accessibility errors, digital divide, data biases.	Accessibility compliance, personalization, user-centered design.	Visual/hearing impairments (contrast, sign language).	7 and 8
Exploring the role of generative AI in higher education: Semi-structured interviews with students with disabilities	Pierrès et al. [38]	ChatGPT, GPT-4, Perplexity.ai	Accessibility issues, reduced human interaction.	UDL alignment, autonomy for disabled students.	Visual impairments (navigation, labels).	5 and 7
Promoting equity and addressing concerns in teaching and learning with artificial intelligence	Garcia Ramos & Wilson-Kennedy [42]	ChatGPT, RxnScribe, LLMs	Access gaps, costs, biases, lack of bias training.	UDL alignment, personalized learning, mobile support.	Linguistic barriers (non-English speakers).	6
Generative AI in Education and Research: Opportunities, Concerns, and Solutions	Alasadi & Baiz [43]	ChatGPT, GPT-4, Midjourney	AI costs, lack of ethical guidelines.	Linguistic support, personalized learning.	Linguistic barriers (ESL students).	6
Exploring student perspectives on generative AI in higher education learning	Baidoo-Anu et al. [44]	ChatGPT	Digital divide, lack of ethical training.	Improved accessibility, enhanced comprehension.	General accessibility (low-resource students).	8

In this regard, the study by Baidoo-Anu et al. [44] stands out because the researchers conducted interviews to explore how generative AI could improve accessibility for people with sensory, cognitive and motor limitations. This emphasizes the importance of incorporating students' perspectives and opinions into research to better understand their specific needs and the barriers they face in the digital age.

In contrast, other research highlights the benefits of generative AI in education without specifically addressing accessibility barriers [43]. However, they emphasize that it should promote equity and facilitate learning by making course content more accessible and understandable [42]. On the other hand, in order to make the most of the benefits that generative AI can offer to students with physical disabilities, it is advisable to analyze how these tools can address and adapt to the various limitations that they may experience. One method is the International Classification of Functioning, Disability and Health (ICF) of the World Health Organization, which provides a structured framework for assessing the accessibility of environments and technologies [49]. The Principles of Accessibility and Applications of Generative AI can also be reviewed. Table 5 describes strategies to ensure that generative AI tools are perceptible, operable, understandable, and robust. The content is recommended according to the physical limitation and addresses the diverse needs of students [13].

Table 5. Web Content Accessibility Guidelines

Perceptible	Understandable	Robust	Operable
This category evaluates criteria related to content perception, such as font legibility, text alternatives, subtitles, automatic transcriptions, and visual presentation.	These criteria evaluate factors like clear language usage, consistent navigation, and the inclusion of labels and instructions.	This category evaluates the robustness of content, such as support for screen readers and status messages.	This criterion focuses on the accessibility of keyboard navigation.

* Adapted from Acosta-Vargas et al. (2024) [15].

The participation of higher education institutions is also crucial for implementing the technological infrastructure and ensuring that the curriculum content developed by teachers for their classes is accessible to all students. However, professors need to be familiar with these applications and have access to training. Several free applications are available, as well as others that require a subscription, which universities must provide. This involves exploring tools such as Clipchamp, Supreme.ai, Sketch, MetademoLab, Copilot, ChatGPT, Grammarly, Bing, Gemini and Adobe Firefly, all of which are committed to accessibility [15].

Therefore, more studies and projects addressing technological accessibility are needed to ensure that generative AI tools are developed for people at all educational levels, thus meeting their diverse needs and enabling them to fully participate in higher education. This approach emphasizes the integration of these technologies into educational systems as a fundamental part of academic content. It allows students with or without disabilities to keep up with their learning activities, ensuring they do not feel disadvantaged, unmotivated, or unsupported. This approach also creates equal learning opportunities for all.

6. Conclusion

The analysis of the five selected studies concludes that tools such as ChatGPT and GPT-4 support inclusive education through personalized learning and language support, but the studies do not yet address specific accessibility needs, especially for students with motor skills, in addition to the existence of barriers such as costs and the digital divide. The limited number of studies limits the possibility of generalizing the findings, as they may not fully reflect the diversity of student experiences in broader educational contexts. It is important to involve students with disabilities in the design, adaptation, and implementation of this technology, considering that there are different types and levels of disability. This will enable specific needs to be identified and addressed directly, since it is not yet a universal practice in schools or universities. Public policies in countries should promote inclusivity and accessibility in schools with the aim of reducing school dropout rates, in line with international recommendations that integrate human rights, quality education, and the reduction of inequalities. For example, in the United Kingdom, universities have begun to offer generative artificial intelligence chatbots within their learning management systems, which provide support to students in areas such as text correction, content summarization, and interactive support. It is suggested that, rather than viewing disability as a barrier, research should continue to address it as an opportunity for equality. A broader approach to motor disabilities must be included in the agenda, given the scarcity of studies in the analyzed years. Ultimately, all students, whether with or without disabilities, should have equal access to educational and professional opportunities. Researchers are encouraged to conduct more research into disabilities within the field of disability studies, in order to prevent marginalization and promote a more inclusive society, which is the foundation of human rights worldwide.

6.1. Limitations and Future Directions

This systematic review, based on studies selected using PRISMA, has limitations in the generalization of its conclusions due to the small number of studies included. Of the 54 studies evaluated, only five met the inclusion criteria on generative artificial intelligence, accessibility, and higher education, limited to the years 2023-2024, specific databases (Scopus and Web of Science), and the English language.

This limited sample size affects generalizability, as it does not fully reflect the diversity of experiences of students with disabilities, possibly due to narrow inclusion criteria or a lack of sufficient research in this emerging field. However, it contributes by identifying a gap in the provision of support for motor disabilities and suggests that future research should address this issue more broadly to strengthen inclusion. Future research should expand the range of years, include more databases and languages, and consider other disabilities not addressed here.

7. Declarations

7.1. Data Availability Statement

Data sharing is not applicable to this article.

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7.3. Institutional Review Board Statement

Not applicable.

7.4. Informed Consent Statement

Not applicable.

7.5. Declaration of Competing Interest

The author declares that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

8. References

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