

Artificial Intelligence as A Tool for Improving Inclusive Education in Higher Education: Educational Accessibility, Personalized Learning and Social Participation

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Received: 12 February 2026; **Accepted:** 08 March 2026; **Published:** 31 March 2026

Abstract: Artificial intelligence (AI) is increasingly influencing higher education and creating new possibilities for developing more inclusive learning environments. Inclusive higher education requires universities to respond to the diverse academic, physical, linguistic, and social needs of students rather than relying on a single model of teaching and learning. Students with disabilities and learning difficulties may experience particular barriers in reading, writing, communication, accessing educational materials, participating in classroom activities, and using university services. Recent research indicates that artificial intelligence can help reduce some of these barriers through personalized learning, assistive technologies, generative AI, speech recognition, translation, accessible digital materials, and adaptive educational systems. However, the evidence also demonstrates that AI does not automatically produce inclusion and may create new barriers related to cost, digital literacy, reliability, privacy, and academic integrity. This article examines the role of artificial intelligence in improving inclusive higher education, with particular attention to students with disabilities and other learners who require flexible educational support. Empirical evidence from recent studies involving students in the United Kingdom, Switzerland, Spain, Greece, Palestine, and other higher education contexts is discussed. The article argues that AI can improve students' educational and social experiences when it is implemented as a complementary tool alongside teachers, tutors, accessibility specialists, and other university support services. The development of inclusive AI-supported higher education should therefore focus not only on academic achievement but also on accessibility, participation, student autonomy, communication, and students' wider involvement in university life.

Keywords: Artificial intelligence, inclusive education, higher education, students with disabilities, accessibility, personalized learning, assistive technology, generative AI, social inclusion.

Introduction: The development of inclusive higher education has become increasingly important as universities serve students with increasingly diverse educational and social needs. Students enter higher education with different levels of prior preparation, different learning preferences, different languages, and different physical, sensory, cognitive, and communication needs. For some students, conventional teaching methods and standardized educational materials can create barriers that affect their participation and academic progress. Inclusive higher education therefore requires universities to

create learning environments in which students can access educational content, communicate with teachers and peers, participate in academic activities, and use appropriate institutional support. Artificial intelligence has recently emerged as one of the technologies that may contribute to this process. AI can process information, generate explanations, recognize speech, convert speech into text, translate languages, summarize documents, generate educational materials, and provide personalized feedback. These functions can be particularly relevant to students who experience difficulties with conventional forms of

academic communication. At the same time, the increasing availability of generative AI has raised important questions about whether these technologies genuinely improve educational inclusion or whether they may introduce new inequalities.

Recent empirical research provides evidence that students with disabilities are already using generative AI as part of their academic work. Zhao, Cox, and Chen (2025) conducted a survey of students with disabilities at a UK university. The university had more than 30,000 students, including 7,188 registered students with disabilities at the time of the study. The researchers obtained 124 valid responses. Among the respondents, 34.7% reported ADHD, 29% reported specific learning difficulties such as dyslexia or dyspraxia, and 21.8% reported social or communication impairments such as autism. The majority of respondents were undergraduate students, with 69% studying at bachelor's level and 20% at master's level. The study found that chatbots, rewriting applications, and translation software were among the principal forms of generative AI used by participants (Zhao, Cox, & Chen, 2025). (DOI)

The significance of this evidence is that AI is not merely a theoretical possibility for students with disabilities. Students are already using these tools to overcome specific academic barriers. Generative AI can help students organize ideas, clarify difficult information, improve the wording of texts, summarize material, and support academic writing. However, the same study identified concerns about inaccurate AI-generated information, academic integrity, and subscription costs. Students also expressed a desire to receive more institutional training and to participate in the development of university AI policies (Zhao, Cox, & Chen, 2025). (DOI)

These findings indicate that the relationship between AI and inclusion is complex. AI can reduce some barriers, but access to AI, the ability to use it effectively, and the quality of institutional guidance can determine whether students actually benefit from the technology.

Artificial Intelligence and Educational Accessibility

One of the most direct contributions of AI to inclusive higher education is the improvement of educational accessibility. Traditional university teaching often relies on written textbooks, PDF documents, presentations,

spoken lectures, and written examinations. These formats are not equally accessible to all students. Students with visual impairments may require screen-reader-compatible content, students with hearing impairments may require captions or transcripts, and students with learning difficulties may benefit from alternative explanations or additional opportunities to process information. AI-based technologies can support the conversion of educational content into different formats. Speech recognition can convert lectures into text, while text-to-speech systems can transform written materials into audio. Generative AI can provide alternative explanations of complex concepts, and translation systems can assist students who are studying in a language that is not their first language. Image-recognition technologies can also generate descriptions of visual content that can be used by students who rely on screen readers.

A recent integrative review by Dumitru et al. (2026) examined 27 peer-reviewed studies published between 2020 and 2024 concerning AI-driven support for students with disabilities in higher education. The review identified personalized learning and AI-driven assistive technologies as major themes, while also identifying institutional barriers and ethical issues that require further attention. The authors concluded that AI has potential to improve accessibility and academic participation but emphasized that important gaps remain in the evidence, particularly for less-represented disability groups (Dumitru et al., 2026). (DOI)

A separate systematic review by Paglialunga and Melogno (2025) examined 11 studies representing 10 independent experiments and involving a total of 3,033 participants with learning disabilities. Dyslexia was the most frequently studied disability. The interventions most commonly involved personalized or adaptive learning systems and game-based learning. All 11 studies reported positive outcomes, but the authors also found important methodological limitations: 70% of the studies were assessed as having moderate risk of bias and 30% as having high or serious risk of bias. Consequently, the authors argued that positive findings should be interpreted cautiously and that stronger experimental evidence is still needed (Paglialunga & Melogno, 2025). (MDPI)

This evidence is particularly important for higher

education institutions because it demonstrates both the potential and the limitations of AI. The existence of positive findings does not mean that every AI system will improve learning. Instead, universities need to select technologies according to clearly identified educational needs and evaluate whether they actually improve students' experiences.

Personalised Learning and Individual Academic Support

Another important contribution of AI is its capacity to provide more personalized learning experiences. University classrooms frequently contain large numbers of students, which makes it difficult for teachers to provide extensive individual assistance to every learner. Students who need additional explanations may hesitate to ask questions repeatedly or may not have sufficient time to receive individual support. An AI-supported learning environment can provide students with additional explanations, examples, practice questions, summaries, and feedback according to their individual needs. For example, a student who finds an economics concept difficult could request a simpler explanation, a practical example, or additional exercises. Another student may prefer a more advanced explanation or a comparison with a real-world case. This flexibility can help move higher education away from a single standardized learning pathway.

Research combining Universal Design for Learning (UDL) with AI provides an example of this approach. Hyatt and Owenz (2024) examined two graduate-level courses with a combined enrolment of 37 students. More than 30% of participants reported a learning disability and 43% were eligible for disability services. Students were given different ways to complete an AI-related assignment, including rewriting an AI response, commenting on it, or providing a video critique. The researchers reported that students were distributed relatively evenly across the available options and that students expressed overall satisfaction with the AI-based assignment (Hyatt & Owenz, 2024). (Taylor & Francis Online)

The importance of this study lies in the combination of AI with inclusive pedagogy. AI itself was not treated as the inclusive intervention. Instead, the technology was incorporated into an educational design that gave

students alternative ways to demonstrate learning. This distinction is important because inclusive education depends not simply on technology but on the way technology is incorporated into teaching.

AI and Students with Disabilities

Students with disabilities may experience multiple barriers during their university studies. These barriers can concern reading, writing, concentration, communication, organization, or interaction with digital systems. AI can potentially support these activities without requiring students to disclose their difficulties every time they need assistance. The study by Zhao et al. (2025) provides particularly relevant evidence. Among the 124 participants, 61% assessed their digital competence as intermediate and 27% as advanced. The students reported using AI for a range of academic writing activities. The study therefore demonstrates that students with disabilities are not simply passive recipients of accessibility services; many are actively incorporating AI into their own learning practices (Zhao et al., 2025). (DOI)

Research conducted with 33 students with disabilities in German-speaking Switzerland, France, and Germany provides additional qualitative evidence. The participants included neurodiverse students and students with visual impairments, hearing impairments, chronic diseases, and other conditions. Most were bachelor's students, and the largest disciplinary group was social sciences. The researchers examined how students perceived and used ChatGPT in higher education and identified both opportunities and limitations associated with generative AI (Baker et al., 2024). (Springer)

More recent research has also examined AI and emotional or informational support. A study conducted at the University of Alicante included 358 students, of whom 88 identified as having a disability and 270 did not. The study examined students' familiarity with and use of AI-based technologies for informational and emotional support. The researchers found differences between students with and without disabilities in familiarity, frequency of AI use, and perceived usefulness for informational and emotional support, with students without disabilities reporting higher levels in these areas (University of Alicante study, 2026). (MDPI) This finding is particularly significant for

inclusive education because it demonstrates that simply making AI available does not guarantee equal benefit. Students with disabilities may require additional training, accessible interfaces, institutional guidance, or other forms of support to use AI effectively. Therefore, universities should consider not only the availability of AI tools but also students' ability to access and use them.

AI and Social Participation in University Life

Inclusive higher education should not be understood exclusively in terms of academic achievement. Students' university experience also involves relationships with classmates, participation in student organizations, communication with teachers, access to university services, and opportunities to develop social and professional networks. AI can potentially support this wider dimension of inclusion by helping students navigate university information and identify appropriate opportunities. For example, AI-based university assistants can provide information about academic services, accessibility support, student organizations, library resources, campus facilities, and extracurricular activities. Such systems can be particularly useful for students who find university information difficult to navigate.

However, AI should not replace human interaction. Social inclusion ultimately depends on relationships between people. A university chatbot may help a student find a student organization, but it cannot replace the experience of belonging to that organization. Similarly, an AI assistant may help a student understand university procedures, but it cannot replace the role of a tutor or adviser in understanding the student's individual circumstances.

This is why the role of AI in social inclusion should be understood as facilitation rather than substitution. AI can reduce informational barriers and make university services easier to navigate, while human relationships remain central to the student's social experience.

AI and Academic Writing

Academic writing represents one area in which AI has already demonstrated particular relevance for students with disabilities. Writing requires students to organize ideas, maintain concentration, structure arguments, select appropriate vocabulary, and comply with academic conventions. These processes can be

particularly challenging for some students with learning difficulties or neurodiverse conditions. The study by Zhao et al. (2025) found that students with disabilities used chatbots, rewriting applications, and translation software for a range of academic writing tasks. The researchers concluded that generative AI could help students overcome some barriers associated with academic writing, while also emphasizing the need for AI literacy and institutional policy (Zhao et al., 2025). (DOI)

Newer research from Greece provides further empirical evidence. A 2026 repeated-measures study examined AI-assisted writing among Greek-speaking first-year teacher-education students, including students with disabilities. The researchers compared traditional typed essays with AI-supported tasks and tasks requiring critical use of AI. They reported improvements in language, structure, and content when students used AI collaboratively and found particularly notable progress among students with learning difficulties. At the same time, participants considered traditional essay tasks more equitable in terms of access, which the researchers associated with differences in students' familiarity with AI (2026). (ScienceDirect). This result illustrates an important principle for inclusive AI. Introducing a technology does not necessarily make an activity more accessible. Students need opportunities to learn how to use the technology, and universities need to ensure that AI-supported activities do not disadvantage students who have less experience with digital tools.

AI, Career Development and the Transition from University to Employment

The purpose of inclusive higher education extends beyond successful completion of courses. Universities also have a responsibility to prepare students for participation in professional and social life. For students with disabilities, the transition from higher education to employment can involve additional barriers related to communication, access to professional networks, workplace expectations, and recruitment processes. AI may provide support during this transition by helping students practise professional communication, understand job descriptions, prepare application documents, and rehearse interviews. Such support can be particularly useful when students do not have easy access to professional networks or when

they require additional opportunities to practise communication.

At the same time, AI should not independently determine which student receives an internship or employment opportunity. Recruitment and internship systems can reproduce existing inequalities if algorithms are trained on biased data. Therefore, AI-supported career services should provide assistance to students while maintaining transparent criteria and meaningful human oversight. The relationship between inclusive higher education and employment is also emphasized in recent research. Dumitru et al. (2026) note that higher education can contribute to social inclusion and long-term financial independence by improving access to the labour market for individuals with disabilities. Their review therefore places educational accessibility within a broader social context rather than treating inclusion solely as a classroom issue. (DOI)

Institutional Conditions for Effective AI-Supported Inclusion

The evidence suggests that the success of AI in inclusive higher education depends heavily on institutional conditions. Technology must be accessible, students and teachers need appropriate AI literacy, and universities need policies concerning privacy, academic integrity, accessibility, and responsible use. A 2025 systematic review of AI in inclusive education identified accessibility, personalization, and engagement among the major benefits of AI, while also emphasizing barriers related to infrastructure, digital literacy, and ethical considerations. The review therefore supports the view that AI should be integrated into a broader institutional framework rather than introduced as an isolated technological tool. (MDPI)

The same principle is evident in research specifically examining students with disabilities. Zhao et al. (2025) found that students wanted universities to provide training in generative AI and wanted opportunities to participate in AI policymaking. This finding suggests that students should not simply be considered users of institutional AI systems; their experiences should also contribute to the development of those systems. (DOI) Consequently, an inclusive university should treat AI as one element of a larger support environment. Teachers should remain responsible for academic and

pedagogical decisions, accessibility specialists should continue to provide individualized assistance where necessary, and tutors and advisers should maintain direct communication with students. AI can support these professionals by providing information and reducing routine tasks, but it should not replace professional judgement.

Challenges and Limitations

Despite its potential, the use of AI in inclusive higher education involves significant challenges. One of the most important is unequal access. The cost of some AI services can create a new form of digital inequality. This issue was explicitly identified by students with disabilities in the 2025 UK study (Zhao et al., 2025). (DOI)

Another challenge is reliability. Generative AI systems can produce inaccurate or misleading information. Students who rely heavily on AI without sufficient critical evaluation may therefore be exposed to new academic risks. Academic integrity is also an important concern because the use of AI for accessibility and learning support needs to be distinguished from the inappropriate replacement of students' own academic work.

Privacy is another significant issue. AI systems that analyse student behaviour may process information about academic performance, disability, learning difficulties, or patterns of engagement. Universities therefore need clear rules governing the collection, storage, and use of student data.

The research evidence also indicates that the current evidence base remains limited. Paglialunga and Melogno (2025), for example, found positive outcomes across the 11 studies included in their systematic review, but none of the studies received a low-risk-of-bias rating. The majority were assessed as having moderate risk of bias, while the remainder had high or serious risk. This means that positive findings should be considered promising rather than conclusive (Paglialunga & Melogno, 2025). (MDPI) Therefore, future research should include larger samples, longitudinal designs, more diverse disability groups, and comparisons between different institutional contexts. It is also important to examine whether AI improves not only short-term academic performance but also longer-term outcomes such as retention,

progression, graduation, social participation, and transition to employment.

CONCLUSION

Artificial intelligence is becoming an increasingly relevant tool for improving inclusive higher education. Existing evidence demonstrates that students with disabilities already use generative AI and other AI-supported technologies to overcome barriers in academic writing, communication, and access to educational information. Research involving 124 students with disabilities in the United Kingdom, 37 graduate students in a UDL-based AI learning environment, 358 students at the University of Alicante, and participants from several European higher education contexts provides empirical evidence that AI can contribute to personalized learning, accessibility, academic support, and informational or emotional assistance. (DOI).

Nevertheless, the evidence does not justify treating AI as an automatic solution to the challenges of inclusion. Students may have unequal access to AI tools, different levels of digital competence, and different levels of confidence in using them. AI systems may also produce inaccurate information and raise questions concerning privacy and academic integrity. Recent systematic reviews further demonstrate that the evidence base, although promising, still contains methodological limitations. (MDPI). The most meaningful contribution of AI to inclusive higher education therefore lies in its capacity to complement human support. AI can make educational materials more accessible, provide additional explanations, support academic writing, assist communication, facilitate access to university information, and help students develop greater independence in their learning. Teachers, tutors, accessibility specialists, counsellors, and other university professionals remain essential because inclusion is ultimately a human and institutional process.

For higher education institutions, the development of AI-supported inclusion should therefore focus on creating an environment in which technology expands students' opportunities rather than replacing human interaction. The objective should be to ensure that students with different abilities and backgrounds can access educational content, participate meaningfully in

university life, develop academic independence, and prepare for future professional participation. In this context, artificial intelligence should be regarded not as a replacement for inclusive education, but as a technological instrument that can strengthen its accessibility, flexibility, and responsiveness when implemented responsibly.

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