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# Generative Artificial Intelligence for Students with Disabilities: Applications, Benefits and Challenges

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**Abstract:** *Generative Artificial Intelligence (GenAI) has emerged as an important technology in education. Unlike traditional software that mainly provides predefined functions, GenAI can generate text, explanations, summaries, examples, questions, feedback and other learning content in response to user instructions. These capabilities may provide valuable support to students with disabilities who experience difficulties in reading, writing, communication, comprehension, organization and access to conventional learning materials. Recent research shows that students with disabilities are already using chatbots, rewriting applications and translation tools to support academic work. However, the use of GenAI also presents challenges related to accuracy, privacy, academic integrity, affordability, digital inequality, over-dependence and the need for human guidance. This paper reviews the major applications, benefits and challenges of GenAI for students with disabilities. It discusses the use of GenAI for personalized learning, academic writing, reading support, communication, learning-material development, feedback and teacher assistance. The paper also highlights the importance of accessibility, responsible use, teacher training and institutional policies. The review concludes that GenAI can become a useful educational support tool for students with disabilities, but it should complement rather than replace teachers, established assistive technologies and human interaction.*

**Keywords:** *Generative Artificial Intelligence, Students with Disabilities, Inclusive Education, Assistive Technology, Personalized Learning, Accessibility, Chatbots.*

## I. INTRODUCTION

Education is an important means of providing equal opportunities and supporting social and economic development. However, students with disabilities may face different barriers in accessing educational content and participating fully in learning activities. These barriers may be related to reading, writing, communication, concentration, mobility, sensory needs, comprehension or the organization of academic tasks. Digital technologies have increasingly been used to reduce these barriers. Assistive technologies such as screen readers, speech recognition, text-to-speech systems and communication tools have provided important support to learners with disabilities. The development of Artificial Intelligence (AI) has expanded these possibilities by allowing educational technologies to provide more flexible and personalized assistance. Generative Artificial Intelligence represents a major development in this area. GenAI systems can produce new content based on user instructions. Depending on the system, they can generate explanations, summaries, questions, examples, written responses, translations, learning activities and feedback. This ability creates new possibilities for students who require different forms of educational support.

The emergence of publicly available GenAI tools, particularly since the introduction of ChatGPT in 2022, has increased interest in their educational applications. UNESCO has emphasized that GenAI can support teaching and learning but should be used through a human-centred approach that considers privacy, equity, safety, human agency and educational quality [6].

The potential relevance of GenAI for students with disabilities is particularly important. A 2025 study involving 124 students with disabilities in higher education found that chatbots, rewriting applications and translation software were being used for academic writing and related tasks. The study also identified concerns about inaccurate responses, academic-integrity risks and subscription costs. Students expressed interest in institutional training and participation in GenAI policy development [1].

Recent research also indicates that GenAI applications in special education remain at an early stage. A 2025 systematic review synthesized 33 studies and found that GenAI was frequently used as a pedagogical assistant. The review also identified ethical, technical and competency-related concerns and concluded that further research is needed [2].

Similarly, a 2025 scoping review of GenAI for neurodivergent school students found potential for personalized learning and teacher support, but noted limited empirical evidence and a gap between theoretical potential and practical classroom implementation [3].

Therefore, GenAI should not be viewed simply as another digital learning tool. Its ability to interact with users and generate content creates opportunities for individualized support, but also introduces new responsibilities for teachers, institutions, technology developers and students.

This paper provides a descriptive review of the applications, benefits and challenges of GenAI for students with disabilities. It focuses on how GenAI can support learning while recognizing the limitations and risks that must be addressed for responsible implementation.

## II. OBJECTIVES OF THE STUDY

The main objectives of this paper are:

- 1) To examine the role of Generative Artificial Intelligence in supporting students with disabilities.
- 2) To identify important educational applications of GenAI for students with different learning needs.
- 3) To discuss the potential benefits of GenAI for accessibility and personalized learning.
- 4) To examine the major challenges associated with the use of GenAI by students with disabilities.
- 5) To discuss the role of teachers and educational institutions in responsible GenAI use.
- 6) To identify important research gaps and future directions.

## III. REVIEW APPROACH

This paper adopts a descriptive literature review approach. Relevant academic research concerning Generative Artificial Intelligence, inclusive education, special education, assistive technologies and students with disabilities was examined.

Particular attention was given to recent research because GenAI is a rapidly developing field. Recent empirical studies, literature reviews and policy guidance were considered to identify major applications, benefits, limitations and emerging research directions.

The review does not claim to be a systematic review or meta-analysis. Instead, it provides a structured discussion of the available literature and organizes the findings around three major themes: applications, benefits and challenges.

## IV. GENERATIVE AI IN EDUCATION

Generative AI refers to AI systems capable of producing new content in response to instructions or prompts. Depending on the system, the generated content may include text, images, audio, video, computer code or other forms of information.

In education, GenAI can interact with students through natural language. A learner can ask a question, request a simpler explanation, ask for an example or seek feedback. This interaction can make learning more flexible because the student does not always have to depend on a fixed textbook, worksheet or predefined learning activity.

GenAI can also help educators create learning materials. Teachers may use it to develop explanations, questions, examples, summaries or alternative versions of learning content. In inclusive classrooms, such flexibility may help teachers prepare materials that address different learning requirements.

However, GenAI does not understand students in the same way as a teacher, specialist or caregiver. Its responses are generated from patterns in data and may contain errors. Therefore, the technology should be used with appropriate checking and human supervision.

## V. APPLICATIONS OF GENERATIVE AI FOR STUDENTS WITH DISABILITIES

### A. Personalized Learning Support

One of the most important potential applications of GenAI is personalized learning. Students with disabilities may have different learning speeds, communication preferences and support requirements. A single teaching method may not work equally well for every learner.

GenAI can generate explanations at different levels of difficulty. For example, a student may ask for a complex paragraph to be rewritten in simple language. Another student may ask for additional examples or step-by-step explanations.

This flexibility can allow students to interact with learning content according to their individual needs. Recent research on neurodivergent school students has identified personalized learning as one of the major areas of GenAI application [3].

However, personalization should not be considered automatically effective. Teachers should determine whether the generated content is appropriate for the student's learning objectives and individual needs.

### B. Academic Writing Support

Writing can be challenging for some students with disabilities. Students with dyslexia, ADHD, dyspraxia and autism, among others, may experience difficulties with organizing ideas, grammar, sentence construction or maintaining focus during lengthy writing tasks.

GenAI can assist with brainstorming, organizing ideas, rewriting sentences, improving clarity and checking grammar. It can also help students understand how a written response can be structured.

Research involving students with disabilities in higher education provides direct evidence of these uses. The study found that students used chatbots and rewriting applications across different stages of academic writing [1].

The purpose should be to support the student's own thinking and expression rather than simply producing a complete assignment for submission.

### *C. Reading and Comprehension Support*

Students may experience difficulty understanding long, complex or technical texts. GenAI can provide summaries, simpler explanations, definitions and examples.

For example, a student may provide a paragraph and ask for it to be explained using simple language. A learner can also ask for important concepts to be identified or for a long text to be divided into smaller sections.

Such support may reduce the cognitive burden associated with processing large amounts of information. However, generated summaries should be checked because important information may sometimes be omitted or incorrectly represented.

### *D. Communication Support*

Communication is another potential area of GenAI application. Students who experience difficulties with written or spoken communication may use AI-assisted systems to help express ideas more clearly.

GenAI may help generate sentences, suggest alternative wording, translate information or support communication between users with different language abilities.

Recent literature identifies communication and augmentative and alternative communication as promising areas for AI-supported inclusion. However, research evidence remains uneven, and GenAI should not replace established communication support when a student depends on specialist systems [13].

### *E. Support for Students with Visual Impairments*

GenAI can potentially support students with visual impairments by helping convert information into accessible descriptions or providing conversational assistance.

Recent research on undergraduate students with visual impairments indicates potential for personalized adaptation, access to educational content, teacher augmentation and greater educational parity [4].

The usefulness of these systems depends strongly on the quality of the interface and the accessibility of the underlying technology. GenAI should therefore complement, rather than replace, established accessibility tools such as screen readers and other assistive technologies.

### *F. Support for Neurodivergent Learners*

Students with autism, ADHD, dyslexia and other forms of neurodivergence may benefit from flexible explanations, task organization and personalized learning support.

GenAI can help break larger tasks into smaller steps, provide reminders or create alternative explanations. It may also support educators in preparing individualized learning activities.

A recent review of GenAI for neurodivergent school students found potential applications in personalized learning, teacher support and individualized education planning. At the same time, the review emphasized the limited amount of original empirical evidence available [3].

### *G. Generation of Accessible Learning Materials*

Teachers can use GenAI to create multiple versions of learning materials. A lesson can potentially be converted into a short summary, a question-and-answer format, simple explanations or additional examples.

This can be useful in classrooms where students have different levels of understanding or different accessibility requirements.

The use of GenAI for this purpose should still involve teacher review. Generated materials may contain factual errors or may not fully address the student's specific needs.

#### *H. Feedback and Academic Assistance*

GenAI can provide immediate responses to student questions and can offer preliminary feedback on written work. This may be useful when students require repeated explanations or additional practice.

For example, a learner can ask why an answer is incorrect, request another example or ask for a concept to be explained differently. Such immediate assistance may increase learning opportunities outside normal classroom hours. Nevertheless, AI-generated feedback should not be treated as equivalent to professional teacher feedback, particularly for complex or sensitive educational decisions.

### **VI. BENEFITS OF GENERATIVE AI FOR STUDENTS WITH DISABILITIES**

#### *A. Improved Accessibility*

GenAI can provide information in different formats and levels of complexity. This flexibility can reduce barriers to educational content.

Students may ask for summaries, simplified explanations, translations or alternative forms of presentation. Such features can complement conventional accessibility tools.

#### *B. Personalized Learning*

Students do not learn in exactly the same way. GenAI can provide individualized responses based on the student's questions and requests.

This may be particularly valuable for students who require additional explanation, repeated practice or a different presentation of information.

#### *C. Increased Independence*

GenAI can provide immediate assistance without requiring the student to wait for a teacher or another person for every small question.

This may increase independence in completing routine academic tasks. However, independence should mean greater control over learning, not complete dependence on AI.

#### *D. Support for Academic Writing*

For students who experience writing difficulties, GenAI can provide support with planning, organization, grammar and language. Research with students with disabilities confirms that academic writing is already an important area of GenAI use [1].

#### *E. Flexible Learning*

GenAI tools can potentially be used at different times and locations. Students may therefore receive additional learning support beyond classroom hours.

This flexibility can be helpful for students who require more time or repeated explanations.

#### *F. Teacher Support*

GenAI can also benefit teachers. It may help prepare lesson ideas, examples, questions and alternative explanations. This can reduce some routine preparation work and allow teachers to spend more time on direct student support.

However, research warns against excessive automation and emphasizes the continued importance of teacher involvement [3].

#### *G. Greater Participation*

When students can access information in a form that better matches their needs, they may be more able to participate in academic activities.

This can contribute to classroom inclusion and reduce some barriers between students with disabilities and their peers.

### **VII. CHALLENGES OF GENERATIVE AI**

#### *A. Accuracy of Information*

One of the most important challenges is that GenAI can produce incorrect information. It may provide an answer that appears convincing but is factually wrong.

This is especially important in education because students may accept generated information without checking it. Research involving students with disabilities identified inaccurate answers as one of their major concerns [1]. Therefore, students should be taught to verify important information using reliable sources and teacher guidance.

#### *B. Privacy and Data Protection*

Students may enter personal information into AI systems. For students with disabilities, this could potentially include sensitive educational or disability-related information.

UNESCO has emphasized the importance of data privacy and human-centred governance when implementing GenAI in education [6].

Educational institutions should therefore establish clear rules regarding what information can be entered into AI systems.

#### *C. Academic Integrity*

GenAI can generate essays, answers and other academic content. This creates concerns about plagiarism, inappropriate assistance and whether submitted work represents the student's own learning.

At the same time, a complete ban on GenAI may unintentionally disadvantage students who use it as an accessibility support.

The appropriate response is therefore not simply to prohibit the technology. Institutions should clearly distinguish between legitimate learning support and inappropriate replacement of student work.

#### *D. Digital Inequality*

Not all students have equal access to devices, reliable internet connections or paid AI services.

Subscription costs may create additional barriers. Research involving students with disabilities specifically identified subscription costs as a concern [1].

If educational institutions depend heavily on paid GenAI tools, existing educational inequalities may increase.

#### *E. Over-Dependence on AI*

Students may become overly dependent on AI-generated answers. Excessive dependence can reduce opportunities to develop independent thinking, writing and problem-solving skills.

GenAI should therefore be used to support learning rather than eliminate the need for learning.

#### *F. Bias and Fairness*

AI systems learn from large datasets that may contain biases. As a result, generated responses may not always represent all cultures, languages, disability experiences or educational contexts fairly.

This creates an important concern for inclusive education because a system intended to support inclusion should not reproduce existing forms of exclusion.

#### *G. Limited Disability-Specific Evidence*

The evidence base for GenAI and disability education is still developing. Recent research indicates that some disability groups, especially autism and dyslexia, receive more research attention than visual, hearing and motor impairments [13].

More research is needed across different disability groups, educational levels, countries and socioeconomic contexts.

#### *H. Lack of Teacher Training*

Teachers need sufficient knowledge to understand both the benefits and limitations of GenAI.

Without appropriate training, teachers may either avoid useful technologies or use them without adequate safeguards.

Research with students with disabilities has also identified a demand for institutional GenAI training [1].

### **VIII. ROLE OF TEACHERS IN GENAI-SUPPORTED INCLUSIVE EDUCATION**

Teachers remain central to inclusive education. GenAI can provide information and generate educational content, but it cannot fully replace the professional judgment, empathy and understanding of a teacher.

Teachers can help students decide when GenAI should be used and how its outputs should be evaluated. They can also identify whether a generated response is suitable for the student's specific educational needs.

Teacher involvement is particularly important when students have complex support requirements. A teacher or specialist can consider factors that a general-purpose AI system may not recognize.

Teachers should therefore be viewed as facilitators of human-AI collaboration rather than as users who simply delegate teaching tasks to AI.

Educational institutions should provide teachers with training on appropriate GenAI applications, checking AI-generated information, privacy and data protection, academic integrity, accessibility, responsible prompting and disability-specific considerations.

### IX. RESPONSIBLE USE OF GENERATIVE AI

Responsible use requires a balance between technological opportunity and educational responsibility.

First, students should understand that GenAI is a support tool and not always a reliable source of information. Important information should be verified.

Second, institutions should develop clear and accessible policies. These policies should explain acceptable and unacceptable uses of GenAI in academic activities.

Third, privacy should be protected. Students should not be encouraged to enter unnecessary personal or sensitive information into public AI systems.

Fourth, accessibility should be considered when selecting AI tools. A technology may be powerful but still be difficult for a particular student to use.

Fifth, students with disabilities should have a voice in decisions about AI adoption. Research indicates that students with disabilities want greater involvement in GenAI policymaking [1].

Finally, GenAI should be introduced in a way that strengthens rather than reduces human interaction.

UNESCO recommends a human-centred approach to GenAI in education, emphasizing safe, equitable, meaningful and ethical use [6].

### X. RESEARCH GAPS

The current literature indicates several important gaps.

First, much of the existing evidence is still conceptual or exploratory. There is a need for more empirical research measuring actual learning outcomes.

Second, research is uneven across disability groups. Some groups, including neurodivergent learners, receive more attention than students with sensory or physical disabilities [13].

Third, more research is required in developing countries. Most current evidence has been generated in a limited number of countries, reducing the generalizability of findings.

Fourth, research should examine long-term effects. It is important to understand whether GenAI improves learning and independence over time or whether excessive use creates dependency.

Fifth, more research is needed on teacher readiness and institutional implementation.

Sixth, accessibility should be evaluated directly. Future studies should not assume that a general-purpose GenAI system is automatically accessible to all users.

Finally, students with disabilities should be more actively involved in research design and technology development. Their experiences can help identify practical problems that may not be visible to developers or researchers.

### XI. FUTURE DIRECTIONS

The future of GenAI in disability-inclusive education is likely to involve greater personalization and multimodal interaction.

Future systems may combine text, speech, images and other forms of interaction to provide more flexible learning support. This could be particularly useful for students who have difficulty interacting with conventional text-based educational resources.

Research should focus on developing AI systems that are designed with accessibility from the beginning rather than adding accessibility after development.

There is also a need for stronger collaboration between teachers, disability specialists, students, researchers and technology developers. Such collaboration can ensure that AI tools address real educational needs.

Educational institutions should also develop clear frameworks for responsible AI use. These frameworks should address privacy, accessibility, academic integrity, teacher training, student AI literacy and equitable access.

Another important direction is the development of evidence-based guidelines for different disability groups. The needs of a student with dyslexia may differ considerably from those of a student with visual, hearing, physical or communication-related disabilities. Finally, future research should move beyond asking whether GenAI is useful and examine when, for whom and under what conditions it is useful.

## XII. DISCUSSION

The literature reviewed in this paper indicates that GenAI has meaningful potential to support students with disabilities. Its greatest advantage is flexibility. Unlike conventional learning resources that provide fixed content, GenAI can respond to different questions and requests.

This flexibility may support students who need simplified explanations, additional examples, writing assistance, communication support or alternative ways of accessing information.

However, the evidence does not support the idea that GenAI is a complete solution for inclusive education. Current research remains relatively limited, and several important concerns remain unresolved. Recent studies have repeatedly identified accuracy, privacy, over-reliance, academic integrity, cost and the need for human oversight as important issues [1], [2], [3].

The balance between assistance and independence is particularly important. If GenAI is used to help students understand, organize and communicate their own ideas, it can support learning. If it is used to complete learning tasks without student involvement, it may reduce learning opportunities.

The same principle applies to teachers. GenAI can reduce some routine work, but the professional role of teachers remains essential. Teachers understand the social, emotional and educational context of their students in ways that general-purpose AI systems cannot fully reproduce.

Therefore, the most appropriate approach is human-AI collaboration. GenAI should extend educational support while keeping students, teachers and specialists at the centre of decision-making.

## XIII. CONCLUSION

Generative Artificial Intelligence is creating new possibilities for inclusive education. For students with disabilities, GenAI can provide personalized explanations, writing support, reading assistance, communication support, accessible learning materials and immediate academic assistance.

The technology can potentially improve accessibility, flexibility and independence. Recent research already shows that students with disabilities are using GenAI tools for academic writing and other educational tasks. Research involving visually impaired learners also indicates potential for personalized adaptation and improved access to educational content [1], [4].

At the same time, significant challenges remain. Inaccurate information, privacy concerns, academic integrity, digital inequality, bias, over-dependence and limited disability-specific evidence must be addressed.

The future success of GenAI in inclusive education will therefore depend not only on technological development but also on responsible implementation. Teachers need appropriate training, institutions need clear policies, and students need AI literacy. Most importantly, students with disabilities should be included in decisions concerning the technologies designed to support them.

GenAI should not replace teachers, assistive technologies or human relationships. Instead, it should be used as an additional support that helps students access information, participate in learning and develop greater independence.

The overall evidence suggests that Generative AI has significant potential to support disability-inclusive education, but its value depends on accessibility, responsible use, human oversight and equitable access.

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