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From Access to Empowerment: How Artificial Intelligence is Transforming Learning Experiences for Students with Physical Disabilities in Kenyan Universities

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From Access to Empowerment: How Artificial Intelligence is Transforming Learning Experiences for Students with Physical Disabilities in Kenyan Universities

Abstract

Purpose – This paper examines how Artificial Intelligence (AI) is reshaping academic experiences for students with physical disabilities (SWPDs) in Kenyan universities. It explores the practical role of AI in enhancing accessibility, independent learning, communication, classroom participation, mobility, assessment, and digital inclusion within university academic environments.

Design/methodology/approach – The paper adopts a practical and experience-based approach informed by observations from teaching spaces, e-learning environments, computer laboratories, disability support offices, student service centers, and ICT departments across selected Kenyan universities. Insights are drawn from institutional practices, emerging AI applications, accessibility experiences, and current literature on inclusive higher education and AI-supported learning.

Findings – AI technologies are increasingly improving academic participation for SWPDs through speech-to-text applications, AI-powered note-taking tools, automated captioning systems, smart mobility applications, adaptive learning platforms, AI chatbots, predictive writing tools, and intelligent assistive technologies. These tools support independent learning, reduce physical strain, improve communication, and enhance participation in face-to-face, blended, and online learning environments. However, implementation remains uneven due to inadequate infrastructure, unreliable internet connectivity, limited staff competencies, affordability challenges, weak institutional policies, and insufficient involvement of students with disabilities in AI planning and deployment. In many universities, AI adoption focuses on general digital transformation without fully integrating accessibility and disability inclusion considerations.

Practical implications – Kenyan universities should adopt inclusive AI implementation frameworks that integrate accessibility into teaching, assessment, student support, digital learning, and campus services. Institutions should prioritize affordable AI solutions, continuous staff training, participatory technology planning, and accessible digital infrastructure to improve academic inclusion and student independence.

Originality/value – This paper contributes practical insights into how AI can support inclusive higher education for students with physical disabilities in Sub-Saharan Africa. It highlights context-specific experiences from Kenyan universities and demonstrates how AI can move institutions beyond structural accessibility toward functional and participatory inclusion in academic environments.

Keywords: Artificial Intelligence; Students with physical disabilities; Inclusive higher education; Academic accessibility; Assistive technologies; Digital inclusion; Kenya

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Introduction

Artificial Intelligence (AI) is rapidly transforming higher education by changing how students learn, communicate, access information, complete assignments, and participate in academic life. Universities worldwide are increasingly integrating AI into teaching, learning management systems, student support services, research processes, and administrative operations (Shwedeh, 2024; Yang et al., 2026). According to Maina et.al, (2026), the growing adoption of digital learning environments and educational technologies in Kenya presents new opportunities for improving inclusion and participation for students with physical disabilities (SWPDs).

For many SWPDs, university education is shaped not only by academic challenges but also by physical, technological, and operational barriers within learning environments. Difficulties navigating lecture halls, using fixed computer workstations, accessing digital platforms, taking notes during lectures, completing assessments, and participating in group discussions often limit full participation in academic activities (Kirsten & Robertson, 2025). Although Kenyan universities have made progress in structural accessibility through ramps, elevators, and accessible buildings, many functional barriers remain within classrooms, online learning systems, laboratories, hostels, and student support services (Rana et al., 2026).

AI technologies provide practical opportunities to address these challenges by enabling more flexible, adaptive, and accessible learning environments. Speech recognition systems, AI-powered transcription tools, virtual assistants, predictive writing applications, smart mobility technologies, and adaptive e-learning platforms are increasingly helping students with physical disabilities participate more independently in academic activities (Ahmed et al., 2025). These technologies reduce dependence on physical assistance and improve access to learning materials, communication platforms, assessments, and classroom interactions. Ahmed et al, observes that in lecture environments, AI-powered transcription and captioning tools help students who experience difficulties with note-taking due to limited hand mobility. In online learning spaces, adaptive AI systems personalize content delivery and improve accessibility through voice navigation, automated summaries, and intelligent user support. AI-driven applications also support students in conducting research, organizing coursework, managing schedules, and communicating with lecturers and peers (Chopra et al., 2024).

The influence of AI extends beyond classroom learning. AI technologies are increasingly supporting mobility and navigation within university campuses through smart mapping systems, voice-guided navigation tools, and intelligent transport applications (Rhythm et al., 2025). AI chatbots and virtual support assistants are also improving access to university services such as admissions, academic advising, accommodation support, and disability services (Alkishri et al.,

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2025). These developments contribute to greater autonomy, confidence, and participation among SWPDs.

Despite these opportunities, AI integration in Kenyan universities remains inconsistent. Many institutions face infrastructural limitations, insufficient funding, inadequate staff training, and low awareness of accessibility-centered AI implementation. In some cases, universities adopt AI technologies primarily for administrative efficiency or general digital transformation without adequately considering the needs of students with disabilities (Maina et al., 2025; Ngaine, 2025). As a result, some AI systems remain inaccessible, underutilized, or poorly aligned with the realities of SWPDs.

The lack of participatory implementation further limits effectiveness. Students with disabilities are often excluded from technology planning, procurement, and evaluation processes, leading to solutions that may not adequately address practical academic challenges (Wanjiku, 2025). Ethical concerns related to affordability, privacy, digital inequality, and algorithmic bias also continue to influence the effectiveness and sustainability of AI-driven inclusion initiatives.

This paper explores the practical influence of AI on students with physical disabilities in Kenyan universities by examining emerging applications, institutional experiences, and implementation challenges across academic environments. Rather than focusing solely on libraries or ICT centers, the paper considers broader university experiences, including classrooms, online learning, student support services, assessment processes, and campus life. It further highlights practical lessons and recommendations for universities seeking to use AI to create more inclusive, accessible, and student-centered academic environments.

Practical AI Applications in Kenyan University Academic Environments

AI-Supported Learning and Note-Taking

Many SWPDs experience challenges taking notes during lectures due to limited hand mobility or fatigue associated with prolonged writing. AI-powered speech-to-text applications and automated lecture transcription systems are increasingly helping students capture lecture content in real time. These technologies enable students to focus on classroom engagement rather than manual note-taking.

Some universities are also encouraging students to use AI-powered summarization tools to organize lecture content, revise coursework, and simplify complex academic materials. These tools improve study efficiency and reduce physical strain associated with prolonged computer use.

AI in E-Learning and Online Education

Blended and online learning environments have become central to higher education in Kenya. AI-supported learning management systems are improving accessibility through voice navigation, predictive search tools, automated reminders, and personalized learning support. Students with

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mobility limitations benefit from flexible learning schedules and reduced physical movement across campuses.

AI-powered captioning and transcription systems also improve participation during virtual classes and recorded lectures. These technologies support inclusive engagement in online academic discussions and collaborative learning activities.

AI-Powered Communication and Academic Support

AI chatbots and virtual assistants are increasingly supporting students in accessing university services, academic guidance, and technical support. Students can use AI systems to receive information about course registration, examination schedules, accommodation services, and disability support without requiring physical movement across offices.

AI writing assistants also support students in drafting assignments, improving grammar, organizing ideas, and managing academic tasks more efficiently. For students with upper-limb impairments, predictive text and voice-command systems reduce the physical effort associated with typing and editing coursework.

Smart Mobility and Campus Navigation

Navigating large university campuses remains difficult for many students with physical disabilities. AI-enabled navigation applications, smart campus maps, and voice-guided mobility systems can help students identify accessible routes, elevators, lecture halls, offices, and service points more efficiently.

These technologies are particularly important in universities with expansive campuses, uneven terrain, or older infrastructure that presents mobility challenges.

AI and Inclusive Assessment Practices

AI technologies are increasingly influencing assessment practices by supporting flexible and accessible examinations. Voice-input systems, adaptive digital assessments, and automated accessibility adjustments can help SWPDs complete assignments and examinations with greater independence.

AI-assisted assessment tools also support remote examinations and continuous assessment models, reducing physical movement and improving academic participation.

Practical Challenges Affecting AI Inclusion in Kenyan Universities

Limited Infrastructure and Connectivity

Reliable internet connectivity, electricity supply, and modern ICT infrastructure remain inconsistent across many Kenyan universities. AI systems that require stable internet access may become ineffective in environments with poor connectivity or limited digital resources.

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High Costs of AI Accessibility Technologies

Advanced AI-powered assistive technologies remain expensive for many institutions and students. Universities with constrained budgets often prioritize general ICT investments over disability-focused technologies.

Limited Staff Awareness and Training

Lecturers, ICT staff, and administrators may lack adequate knowledge of AI accessibility tools and inclusive digital practices. As a result, students often receive limited technical support when using AI systems in academic environments.

Inaccessible Digital Platforms

Some e-learning systems and university portals remain difficult to navigate for students using assistive technologies. AI adoption without accessibility testing can unintentionally reinforce exclusion.

Limited Student Participation in AI Planning

Students with physical disabilities are rarely involved in institutional decisions relating to AI procurement, implementation, and evaluation. This limits the practical relevance of many AI solutions introduced within universities.

Lessons Learned from Kenyan Universities

1. AI works best when integrated into everyday academic activities: AI technologies become more effective when embedded within teaching, assessment, communication, and student support systems rather than treated as standalone accessibility tools.
2. Accessibility should guide digital transformation: Universities should ensure that AI implementation strategies prioritize inclusive participation from the beginning.
3. Low-cost AI solutions can create a significant impact: Simple technologies such as speech-to-text tools, automated captions, predictive writing systems, and voice assistants can substantially improve accessibility even in resource-constrained institutions.
4. Student participation improves effectiveness: Involving SWPDs in selecting and evaluating AI technologies helps institutions identify practical academic needs and usability concerns.
5. Staff capacity building is essential: Continuous training enables lecturers, ICT staff, and student support personnel to effectively support inclusive AI implementation.

Practical Recommendations for Kenyan Universities

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- Develop institution-wide AI accessibility and inclusion policies.
- Integrate AI accessibility tools into classrooms, e-learning systems, laboratories, and student support services.
- Provide regular staff training on AI-supported inclusive teaching and learning practices.
- Establish participatory mechanisms involving SWPDs in technology planning and procurement.
- Invest in affordable AI-powered assistive technologies and adaptive learning systems.
- Improve campus internet connectivity and digital infrastructure.
- Conduct regular accessibility audits of digital platforms and AI systems.
- Promote partnerships with technology companies, disability organizations, and government agencies to support inclusive AI innovation.
- Encourage inclusive curriculum development that integrates accessible digital learning practices.
- Create institutional support centers for AI accessibility and assistive technology training.

Conclusion

Artificial Intelligence is increasingly shaping the experiences of students with physical disabilities in Kenyan universities by improving accessibility, communication, academic participation, mobility, and independent learning. AI-powered technologies are helping universities move beyond traditional structural accessibility toward more flexible, inclusive, and student-centered academic environments.

However, the success of AI-driven inclusion depends on how universities design, implement, and sustain these technologies. Institutions must move beyond general digital transformation agendas and deliberately integrate accessibility, affordability, and user participation into AI strategies. Inclusive implementation requires supportive policies, staff competencies, accessible digital infrastructure, and active involvement of students with disabilities in institutional decision-making.

As Kenyan universities continue adopting AI technologies, there is significant opportunity to strengthen inclusive higher education through practical, low-cost, and context-sensitive interventions. Universities that align AI innovation with accessibility and participation principles are more likely to create equitable academic environments where students with physical disabilities can learn independently, participate fully, and achieve their academic potential.

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