

The logo for RADemics, featuring the text "RADemics" in white on a blue arrow-shaped background pointing to the right. The arrow is part of a larger blue horizontal bar that is positioned over a dark blue vertical bar on the left side of the page.

RADemics

Digital Education Platforms and EdTech Solutions for Inclusive Learning

A decorative graphic consisting of several thin, curved lines in shades of blue and grey, originating from the bottom left and extending upwards and to the right, resembling stylized grass or reeds.

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Digital Education Platforms and EdTech Solutions for Inclusive Learning

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Abstract

Accelerated digital transformation has redefined contemporary education, positioning digital platforms and educational technologies at the core of instructional delivery and learner engagement. This chapter critically examines how digital education platforms and EdTech solutions contribute to inclusive learning through theoretically grounded, technologically robust, and policy-aligned frameworks. Drawing upon constructivist and connectivist perspectives, the discussion situates inclusive digital education within equity-centered pedagogical models that emphasize participation, accessibility, and learner agency. The analysis explores AI-driven personalization, adaptive learning systems, explainable artificial intelligence, accessibility engineering, assistive technologies, and learning analytics as mechanisms for addressing diverse cognitive, sensory, socio-economic, and cultural needs. Socio-technical barriers, including digital divide dynamics, infrastructural inequities, algorithmic bias, and governance limitations, are systematically evaluated to illuminate structural constraints affecting equitable implementation. A multi-layer governance and sustainability framework was proposed to integrate transparency, accountability, institutional readiness, and ethical data stewardship within inclusive EdTech ecosystems. The chapter advances a comprehensive conceptual synthesis that bridges theory, technological design, policy intervention, and long-term sustainability, contributing a structured foundation for future research and practice in equity-centered digital education.

Keywords: Inclusive Education; EdTech; Artificial Intelligence in Education; Accessibility Engineering; Digital Divide; Sustainable Digital Transformation.

Introduction

Digital transformation within education has progressed from peripheral experimentation to structural integration across global learning systems. Digital education platforms now function as primary environments for curriculum delivery, assessment, collaboration, and academic management in schools, universities, and professional training contexts. Rapid expansion of learning management systems, massive open online courses, intelligent tutoring systems, and mobile learning applications reflects a systemic shift toward technology-mediated pedagogy. This transition gained momentum during large-scale disruptions such as the COVID-19 pandemic, which exposed both the scalability of digital platforms and the fragility of unequal access infrastructures. Educational institutions across developed and developing regions adopted remote and hybrid models at unprecedented speed, revealing deep disparities in connectivity, device

availability, digital literacy, and accessibility compliance. Digital transformation therefore represents not merely technological modernization but a socio-educational restructuring that influences participation, knowledge construction, and academic opportunity. Inclusive learning has consequently emerged as a central concern within this transformation, as equitable participation remains uneven across demographic, geographic, and socio-economic boundaries. A critical scholarly inquiry into digital education must therefore examine how technological architectures intersect with inclusion frameworks, ensuring that innovation aligns with principles of accessibility, representation, and learner agency rather than reinforcing pre-existing inequalities embedded within traditional educational systems [1–5].

Inclusive education, grounded in equity and social justice paradigms, seeks meaningful participation and academic progression for learners with diverse abilities, backgrounds, and socio-cultural identities. Digital platforms possess capacity to operationalize inclusive pedagogy through multimodal content delivery, adaptive feedback mechanisms, flexible pacing structures, and collaborative knowledge-building tools. Universal Design for Learning provides theoretical alignment for this integration by advocating multiple means of representation, engagement, and expression within instructional environments. Constructivist learning theory further supports inclusive digital ecosystems by positioning learners as active participants who construct understanding through interaction and contextual exploration. Connectivist perspectives extend this model into networked environments where knowledge emerges across distributed digital nodes and social communities. Integration of these theoretical orientations within platform design strengthens responsiveness to cognitive variability, linguistic diversity, and differentiated learning pathways. Inclusive digital education therefore requires deliberate synthesis of pedagogy and technological engineering so that platform functionality reflects diversity-sensitive principles. Without such alignment, digital transformation risks reproducing standardized instructional patterns that marginalize learners whose needs diverge from dominant design assumptions embedded within software architectures [6–10].