Chapter 4
Beyond Boundaries: AI-Powered Personalized Learning in the Educational Metaverse for Global Equity

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ABSTRACT

This chapter meticulously focuses on use of AI and how tools like educational metaverse might help creating equitable personalized learning, tailored for everyone. This chapter reframes pedagogical and ethical values by centering culturally-relevant learning, contextual integrity, and learner agency. Building on theories the analysis provides a solid way to look at the advantages and drawbacks of AI-driven adaptation. Case studies set in different countries make it clear that how personalization works with AI-powered and immersion-embedded systems. The framework put forwarded by this chapter consists of cultural intelligence, clear personalization, ethical design, and infrastructural scalability. It also lists barriers to equitable implementation and fundamental challenges which need deliberate solution. The framework focuses on ethical design and pedagogical relevance to ensure that AI-supported learning environments are personalization engrossed. This chapter reflects worldwide debate about adaptive learning in order to support the goals of educational equity and global inclusion.

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INTRODUCTION: AI-BASED PERSONALIZATION AND IMMERSION

The fast development of AI technology has brought new and exciting possibilities for upgrading education around the world. Education was usually designed for all learners the same way, with little or no adjustment to teaching and learning resources. Students from underrepresented backgrounds or remote regions have suffered a disadvantage because the lack of flexibility in education limits their chances to learn. AI has the power to come down on these walls by providing personalized learning that matches what each student needs. Adaptive learning, intelligent tutoring systems, and predictive analytics are becoming much more popular, creating new possibilities for equitable learning (Holmes et al., 2023). Luckin et al., 2022). Personalized learning matters as it supports students differently and removes the barriers found in traditional teaching. Thanks to such innovations, the ways we teach are changing, and more people are able to access good learning, preparing the way for a more inclusive education. These upgrades in technology are making it possible for content and instruction to adjust to each student's unique abilities and ways of learning, which raises the standard of education.

This transformation centers on the educational metaverse, which is a digital environment where AI and advanced technology work together to give learners personalized and interactive lessons. It is believed the educational metaverse will eliminate many established educational challenges, such as geography, access, and needing more resources, by joining AI personalization to VR and AR (Kavanagh et al., 2022; Zhang et al., 2023). Learners in these environments can do more than read or watch; they can actively participate in lessons that help them learn in ways that involve many senses and learning methods (Holmes et al., 2023; Wang et al., 2024). Thus, the educational metaverse might help us rethink how we learn, so that it becomes more adaptable, welcoming, and personalized for everyone. Still, this transformation raises new questions about how to give all students, regardless of background or place, access to these new tools. Getting past these entry barriers is key to providing these advanced educational tools to all students. Khalil, Haqdad, & Sultana (2023) note that while the metaverse in education represents exciting new chances, it needs quality planning so that learners who will benefit the most are reached.

Even though AI and the metaverse hold great promise for democratizing education, there are major hurdles to reaching that goal. Even though AI-led tools are effective for individualizing learning, their implementation is restricted by structural issues such as limited high-speed internet and computer access. Such problems tend to arise strongly in places where resources and technology are not readily available, making it difficult for many to use AI-driven learning systems (Williamson, 2023).