

# Artificial Intelligence– Driven Personalization in ODeL for Marginalized Communities

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## ABSTRACT

*This chapter explores how Artificial Intelligence (AI) can transform Open and Distance e-Learning (ODeL) to provide inclusive, personalized, and accessible education for marginalized communities. It examines AI applications such as adaptive learning, predictive analytics, and Natural Language Processing (NLP) to address key challenges like language barriers, learner disengagement, and lack of real-time support. Real-world case studies from India and Kenya demonstrate the impact of AI-driven tools in improving learner outcomes, reducing dropout rates, and increasing equity in education. The chapter also discusses ethical, technical,*

*and implementation barriers, proposing strategic policy recommendations and future research directions. AI is positioned not just as a technological innovation, but as a tool for educational justice and empowerment in low-resource settings.*

## **1. INTRODUCTION TO AI AND ODEL**

The Artificial Intelligence (AI) concept has emerged as something that can transform the Open and Distance e-Learning (ODEL) discipline and offer a chance of transforming access to quality education, particularly among marginalized and underserved communities. Ideally, ODeL eradicates, by design, infrastructural and distance-related limits, resource deficits; the smart automation, customization, and flexibility of learning environments create a new layer to the notion of ODeL presented by AI. As the world of education continues to evolve in the direction of meeting Sustainable Development Goal 4 (SDG 4) education, which incorporates access to inclusive and equitable quality education, the focus has shifted on the use of AI-powered technology to address some of the issues associated with learner disengagement, linguistic diversity, and the lack of real-time academic support. (L. Chen et al., 2020). With further development of AI technologies, such as adaptive learning, predictive analytics, and natural language processing, educational facilities can provide learners with diverse needs with optimized delivery of education even with low resources conditions. This introduction provides a description of how AI can be used as a catalyst in transforming ODeL to become inclusive, context-aware as well as more impactful among vulnerable learners across different parts of the world (Viberg et al., 2024a).

### **1.1. The Evolution of Open and Distance E-Learning (ODEL)**

There has been a major transformation of Open and Distance E-Learning (ODEL), which commenced as the traditional correspondence-based learning to a constantly transforming digitally empowered system that facilitates learning of different learners at different locations. Historically developed to solve concerns of access among learners in rural or under-served regions, early ODeL models were highly dependent on postal based communication and on print media. Along with the emergence of the Information and Communication Technologies (ICT), ODeL was quickly getting online, and interactive rich multimedia experience was possible along with asynchronous learning and virtual interaction (Viberg et al., 2024b). The shifts made learning more accessible and dynamic to more people as they could access learning at their own lights and times (Xu & Ouyang, 2022). However, such challenges as a poor digital infrastructure, speaking barriers, and

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