

Chapter 2

AI–Powered Language Teaching and Learning: Innovations and Challenges

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ABSTRACT

This chapter explores the rapidly evolving landscape of artificial intelligence (AI) in language education, examining both the innovative potential and significant challenges presented by AI-powered tools and systems. The authors investigate how AI is transforming traditional approaches to language teaching and learning, enabling more personalized, adaptive, and engaging educational experiences. The chapter delves into various AI applications, including intelligent tutoring systems, chatbots, speech recognition, and natural language processing, analyzing their impact on language acquisition processes. They also critically examine the ethical, pedagogical, and practical challenges associated with integrating AI into language education. Through a combination of literature review, case studies, and experimental

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research, this chapter provides a comprehensive overview of the current state and future prospects of AI in language teaching and learning.

INTRODUCTION

The field of language education is undergoing a profound transformation, driven by rapid advancements in artificial intelligence (AI) and machine learning technologies. As these technologies continue to evolve, they offer unprecedented opportunities to enhance language teaching and learning processes, making them more efficient, personalized, and engaging (Hancı-Azizoğlu & Kavaklı Ulutaş, 2021; Ölmez & Kavaklı Ulutaş, 2023). AI-powered tools and systems are increasingly being integrated into various aspects of language education, from intelligent tutoring systems that adapt to individual learner needs (Kavaklı Ulutaş & Abuşka, 2023) to sophisticated speech recognition and natural language processing applications that provide instant feedback on pronunciation and grammar.

The potential of AI in language education is vast. It promises to address long-standing challenges in the field, such as providing individualized instruction at scale, offering continuous assessment and feedback, and creating immersive language learning environments. AI technologies can analyze vast amounts of learner data to identify patterns and tailor instruction, accordingly, potentially revolutionizing how languages are taught and learned.

However, the integration of AI into language education also raises important questions and challenges. These include concerns about data privacy and security, the potential for AI to reinforce biases or cultural insensitivities, and the need to ensure that AI tools complement rather than replace human teachers. Additionally, there are pedagogical considerations regarding the effectiveness of AI-driven approaches compared to traditional methods and the potential impact on learners' motivation and engagement.

Hence, the objectives of this chapter are as follows:

- To examine the current applications and potential of AI technologies in language teaching and learning.
- To analyze the challenges and ethical considerations associated with integrating AI into language education.
- To explore future trends and possibilities for AI-powered language education.

Accordingly, the chapter is structured as follows: We begin with a literature review that provides an overview of AI in language education, followed by a methodology section outlining our approach to gathering and analyzing information. We then present

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