Chapter 10

Redefining Traditional Pedagogy:
The Integration of Machine Learning in the Contemporary Language Education Classroom

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ABSTRACT

The digital transformation of education, accelerated by unforeseen global events like the COVID-19 pandemic, has ushered in a new era in pedagogy, including in language instruction. While the shift to online platforms has been swift, the evolution of content from static digital forms to dynamic, interactive experiences driven by artificial intelligence (AI) is still emerging. This chapter explores the transformative potential of machine learning (ML) in redefining traditional language learning materials into adaptive, responsive, and personalised educational experiences. The chapter outlines theoretical applications and presents a prototype app, "TalkToMe," designed to boost speaking practice in the target language. Additionally, it addresses ethical concerns surrounding ML integration in education, ensuring the preservation of academic integrity. This chapter aims to bridge the gap between traditional methodologies and cutting-edge technology, offering a roadmap for the future of language instruction through collaboration between pedagogy and technology.

INTRODUCTION

The onset of the 21st century has begun to integrate an unparalleled fusion of technology and education. Never before have educators had access to such a broad array of tools, designed not just to inform, but to reshape instruction (Dalton-Puffer, 2011; Hussherr & Hussherr, 2017; Warschauer & Healey, 1998). The use of technology in the classroom was accelerated to an unforeseen pace through the advent of global events, especially the Covid-19 pandemic, forcing education to adapt, reinvent, and move predominantly

to online platforms in the provision of emergency teaching (Hodges et al., 2020; Klimova, 2021; W. Li et al., 2021). This digital transformation, while swift, carried with it remnants of traditional pedagogy, often translating physical materials directly into their digital counterparts without harnessing the full potential of the digital medium (Radić et al., 2021). However, now that the pandemic and emergency teaching provisions have become a thing of the past, educators may be considered to contemplate new ways of utilising technology in their everyday practice (Korkmaz & Toraman, 2020).

In the realm of language education, this dynamic is particularly salient. The rich concept of language, with its nuances, cultural contexts, and multifaceted layers of comprehension, presents both challenges and opportunities when integrated with technology (Arnó-Macià & Barés, 2015; Misiejuk et al., 2023). Traditional methods, ranging from vocabulary lists to static grammar exercises, while effective to an extent, often lack the adaptability and responsiveness that the digital age promises (Arnó-Macià & Barés, 2015). It is here, at the intersection of traditional language instruction and cutting-edge technological potential, that Machine Learning (ML) emerges as a potential tool of transformation and extension of traditional methods (Briggs, 2018).

The subsequent sections aim to show some of the ways in which ML, particularly through tools like Large Language Models (LLMs), can redefine the landscape of language education (Jeon & Lee, 2023). By transferring static resources into dynamic, responsive, and tailored experiences, ML is set to change how educators can approach and leverage language instruction and how learners engage with (Bonner et al., 2023). This chapter will address both the potential of this connection between pedagogy and technology, as well as the challenges and ethical considerations it brings forth.

It is important to note that the main argument of this chapter is on utilising machine learning as a tool to enhance traditional teaching methods. It is argued that the future of language instruction is not about replacing the human touch, but about amplifying it (Selwyn, 2019). It is about harnessing the power of ML to complement, enrich, and diversify the learning experience, ensuring that every student not only learns a language but has an opportunity to immerse themselves in it (Kharb & Singh, 2021; Zou et al., 2018).

BACKGROUND

In the heart of every classroom lies a microcosm of the world outside – one that reflects broader trends, attitudes, and shifts. Over the last decade, educators have observed the ebb and flow of students' engagement with language learning, their aspirations mingling with their apprehensions, crafting a complex landscape of challenges and potential (Asiksoy, 2018).

Static Digital Forms vs. Dynamic ML-Powered Experiences

Traditionally, language instruction has been rooted in fixed formats. Be it textbooks, flashcards, or worksheets, these static methods have been the bedrock of foundational language learning (Preis et al., 2023). While effective to a certain extent, they come with inherent limitations. This chapter is inspired by the author's decade long experiences of teaching German at a university in England. Recollecting an instance from the classroom, a group of beginner-level students grappled with the intricacies of the German language. Their primary struggle? Engaging authentically with the language. Static tools offered them limited, often repetitive experiences, which, over time, diminished their enthusiasm. However, for

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