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Integrating AI-Powered Digital English Textbook at Grade12:
Pakistani Students and Teachers' Perceptions

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ABSTRACT

In response to the global emergence of artificial intelligence (AI), the Government of Punjab, Pakistan, conducted a pilot project in 2024, introducing AI-powered digital textbooks for Grade 12 English learners. The project included 80 teachers and 400 learners from Lahore, Pakistan. The present study explores the perspectives of the learners and teachers who participated in this pilot initiative. A concurrent mixed-methods research design was employed, with a sample of 100 students and 40 teachers selected through simple random sampling. Structured questionnaires were used to collect quantitative data from students, while interviews were conducted with teachers. Quantitative data were analyzed using SPSS 27, and thematic analysis of qualitative data was carried out using Claude.ai. The findings revealed that students viewed AI-powered digital textbooks as a novel, dynamic, engaging, and impactful method for learning English. Similarly, teachers regarded AI-powered digital textbooks as highly beneficial for enhancing students' English language proficiency.

KEYWORDS

AI-Powered Digital Textbook, English, Grade 12, Pakistan, Students, Teachers

INTRODUCTION

Since the integration of computers into academia, developing countries have observed a shift toward digitization, marked by the use of electronic versions of analogue books on digital devices such as phones and computers (Agustiana et al., 2021). This paved the way for digital textbooks. Later, due to the global impact of COVID-19 and the rise of artificial intelligence (AI), developed countries transitioned to AI-driven textbooks, whereas developing countries have continued to use digital textbooks (Bori, 2021; Kim & Kim, 2024). An AI-powered digital textbook is a resource that employs AI tools to create customized content, adjusting the pace and difficulty of the material as

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needed (Alyammahi, 2020; Amirtharaj et al., 2023). These textbooks may include exercises tailored to learners' levels, styles, and needs. Supporting comprehension of the syllabus, the AI-based exercises can also modify the level of difficulty (Qin, 2024).

Key features of AI-powered digital textbooks include ubiquity, personalized learning, vocabulary lists, text-to-speech, pronunciation support, speech recognition, and grammatical explanations. In addition, interactive exercises such as quizzes, pronunciation practice, and sentence analysis provide immediate feedback to learners (McCarthy & Yan, 2024). Together, these features—and others—can enhance learning and offer both learners and teachers greater variety, support, and ease in their educational efforts (Chopra et al., 2024). The structure of these textbooks typically combines elements of machine learning, natural language processing, and AI-driven algorithms to create a more dynamic and practical learning experience for students (Argawati & Suryani, 2020; Asakura et al., 2023).

Turning to the Pakistani context, the education system is broadly divided into three types: madrassah education, which aims to produce clergy; a limited number of expensive private schools that prepare students for international exams; and low- to middle-tier public and private schools. Across this system, government institutions, private schools, and colleges follow unified curricula, using both printed and digital textbooks for teaching and learning (Halai & Durrani, 2021). Classrooms typically maintain traditional environments, teaching methods, repetitive exercises, and content design. As a result, both learners and teachers often lose interest. However, there is growing interest among both groups in newer, AI-powered technological materials.

Rationale of the Study

Modern language requires innovative and effective methods to meet the needs of contemporary learners. While printed materials were once sufficient, they now present several limitations, including a lack of internet connectivity, reliance solely on textbooks and exercises, and a restricted approach to learning. English language learners have become increasingly disinterested and dissatisfied with this exclusive dependence on printed materials.

The introduction of digital books marked a significant step forward; however, they too had limitations, such as the absence of personal assistance, limited customization of learning materials, and difficulty in delivering relevant content tailored to students' needs. This highlighted a clear need to integrate AI into digital textbooks.

As the Government of Punjab, Pakistan, launched a pilot project to address these concerns, it became essential to explore the perspectives of the teachers and students involved in order to assess the project's effectiveness and efficiency. Understanding these perspectives is also crucial for evaluating the compatibility and feasibility of implementing AI-powered digital textbooks in the local educational context.

Significance of the Research

In line with this technological initiation, a study was planned and executed based on the "Digital-Punjab" pilot project launched by the Government of Punjab, Pakistan, in 2024. In this project, the government initiated the integration of AI-powered digital English textbooks for Grade 12 students within a specific population. The participating teachers and students were selected from Lahore, the provincial capital of Punjab, Pakistan. This research focuses on English students and teachers who were part of the project and used AI-powered digital textbooks in the classroom.

The significance of this study lies in its exploration of the appropriateness and effectiveness of AI-powered digital textbooks through the views of students and teachers involved in the pilot project. This research is particularly important, as AI-powered digital textbooks have not previously been used in the Pakistani context, or even more broadly in Southeast Asia, for the development of textbooks and teaching materials. In this context, the insights of students and teachers who have used these AI-powered resources are especially valuable. Their opinions may benefit future material developers, textbook authors, content managers, and publishers.

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