Chapter 9
Adoption of Artificial Intelligence in Education Using UTAUT3 Theory: Experimental Study

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ABSTRACT

This study explores the adoption of AI educational tools among higher education students, using the UTAUT3 framework to examine factors that influence user acceptance, engagement, and academic outcomes. The study was conducted as an experimental study, in which participants were divided into treatment and control groups. The treatment group was granted access to an integrated AI educational system comprising intelligent tutoring, personalized learning, and AI-driven writing support. Performance expectancy, effort expectancy, social influence, and facilitating conditions are all influential factors that significantly impact the students' intent to use AI tools. Students belonging to the treatment group showed a significant change in engagement and performance. The results of this study bring to the fore promise of AI in personalizing learning with a strong technological support infrastructure and positive social contexts.

INTRODUCTION

Artificial intelligence (AI) is increasingly valuable in education, offering teachers innovative tools for content creation and deeper insights. AI can generate and refine educational materials like graphics, videos, sounds, presentations, interactive lessons, quizzes, and adaptive learning systems, supporting students in progressing at their own pace. With digital technologies integral to the younger generation's

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learning, AI enhances personalized education through tools like virtualization and gamification. Virtualization shifts traditional classroom settings to online platforms, promoting essential digital skills, while gamification applies game elements to boost student motivation. These approaches, along with blended learning—combining online and in-person activities—support flexible educational environments. M-learning through mobile devices further increases accessibility, enabling students to engage with materials and peers anytime, anywhere, enhancing both flexibility and effectiveness (Svoboda, 2024).

The AI in education market, valued at USD 2,126 million in 2022, is expected to grow at a 36.6% CAGR, reaching USD 25,772 million by 2030, driven by rising investments in AI technology, demand for personalized education, and the need for automated administrative tasks, according to P&S Intelligence (PR Newswire, 2023). The AI in education market is advancing due to the widespread adoption of smart devices and rapid global digitalization. The demand for AI in education is fueled by its advanced features and benefits, attracting investments and encouraging adoption among organizations (PR Newswire, 2023). Among regions, North America led in AI education solutions from 2014 to 2019, a trend projected to persist due to strong educational infrastructure, demand for personalized classroom learning, and increasing EdTech investments. However, Asia-Pacific is expected to show the fastest growth in demand for AI in education during the forecast period. (Research and Markets, Business Wire, 2020)

AI applications in education include intelligent tutoring systems, content delivery systems, virtual facilitators, learning platforms, chatbots, and interactive websites. Between 2014 and 2019, learning platforms saw the highest demand, a trend likely to continue due to rising interest in online and distance education, the integration of advanced technologies, and the popularity of self-learning on digital platforms. Intelligent tutoring systems are expected to experience the fastest growth in demand. (Research and Markets, Business Wire, 2020). AI-powered tools such as personalized learning systems, automated assessments, facial recognition software, social networking sites, and chatbots are increasingly being adopted in education. These technologies support teachers and students by tailoring instruction, providing timely feedback, automating grading, and fostering collaboration. Personalized learning platforms adapt content to individual needs, improving academic outcomes, while automated assessments save time by streamlining grading processes. Facial recognition and predictive analytics offer insights into student behavior and performance, allowing early intervention. Social media tools and chatbots enhance engagement and administrative support (Akgun, S., & Greenhow, C. 2022).

AI applications in education aim to improve teaching learning experiences for teachers, students, and educators, with providers creating unique AI solutions that integrate across various platforms, supporting the rise of online learning for skill development. As AI-backed business applications expand, tech companies are collaborating with colleges to introduce new AI training formats aligned with industry trends. AI can address critical educational challenges like new teaching methods and accelerating SDG 4, though rapid technological progress brings regulatory challenges. UNESCO is helping ensure that AI in education upholds values of equity and inclusion. The covid-19 pandemic significantly disrupted global education, with school closures reducing demand for in-person AI learning. Leading companies responded with innovative strategies—acquisitions, partnerships, and collaborations—to remain competitive (PR Newswire., 2022). AI improves the educational experience by enhancing learning processes. For instance, Century Intelligent Learning uses AI to help teachers create and share curricula online, accessible anytime.AI systems streamline administrative and grading tasks, saving significant time for teachers and staff while boosting productivity. Though promising, AI's rapid integration in education also faces challenges around regulation and policy adaptation.