Students' acceptance and use of generative AI in pharmacy education: international cross-sectional survey based on the extended unified theory of acceptance and use of technology

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Elnaem, Mohamed Hassan [a] ; Okuyan, Betul [b] ; Mubarak, Naeem [c] ; Thabit, Abrar K. [d] ; AbouKhatwa, Merna Mahmoud [e] ; +4 authors

[a] School of Pharmacy and Pharmaceutical Sciences, Ulster University, Coleraine, BT52 ISA, United Kingdom

Abstract

Background: Generative artificial intelligence (GenAI) has significant potential implications for pharmacy education, but its ethical, practical, and pedagogical implications have not been fully explored. Aim: This international study evaluated pharmacy students' acceptance and use of GenAI tools using the Extended Unified Theory of Acceptance and Use of Technology (UTAUT). Method: A cross-sectional survey of pharmacy students from nine countries during the first half of 2024 assessed GenAI usage patterns, curricular integration, and acceptance via the Extended UTAUT framework. After appropriate translation and cultural adaptation, exploratory factor analysis (EFA)

identified key adoption factors. Results: A total of 2009 responses were received. ChatGPT and Quillbot were the tools most frequently utilised. EFA identified three key dimensions: Utility-Driven Adoption, Affordability and Habitual Integration, and Social Influence. Students rated performance and effort expectancy highly, highlighting their perceived usefulness and ease of use of GenAI tools. In contrast, habit and price value received lower ratings, indicating barriers to habitual use and affordability concerns. Gender disparities were noted, with males demonstrating significantly higher acceptance ($p < 0.001$). Additionally, country-specific differences were evident, as Malaysia reported a high performance expectancy, while Egypt exhibited low facilitating conditions. Over 20% indicated an over-reliance on GenAI for assignments, raising ethical concerns. Significant gaps were observed, such as limited ethical awareness—only 10% prioritised legal and ethical training—and uneven curricular integration, with 60% reporting no formal exposure to Generative AI. Conclusion: Findings reveal critical gaps in ethical guidance, equitable access, and structured GenAI integration in pharmacy education. A proactive, context-specific strategy is essential to align technological innovation with pedagogical integrity. © The Author(s) 2025.

Author keywords

Generative AI; Pharmacy education; Pharmacy students; Technology acceptance; UTAUT framework

Indexed keywords

MeSH

Adult; Artificial Intelligence; Attitude of Health Personnel; Cross-Sectional Studies; Curriculum; Education, Pharmacy; Female; Humans; Internationality; Male; Students, Pharmacy; Surveys and Questionnaires; Young Adult

EMTREE medical terms

Article; awareness; ChatGPT; cross-sectional study; demographics; Egypt; exploratory factor analysis; female; frequency; gender inequality; generative artificial intelligence; health survey; human; Likert scale; Malaysia; male; pharmacy education; pharmacy student; postgraduate student; questionnaire; social acceptance; social influence; social media; student; technology; theory; training; undergraduate student; validity; adult; artificial intelligence; curriculum; health personnel attitude; international cooperation; pharmacy student; procedures; psychology; young adult

Device trade names

Commercial names given to devices, used for branding and differentiation in the market, commonly referenced in scientific and clinical research.

Tradename	Country	Manufacturer
SPSS Version 29.0	United States	IBM

Corresponding authors

Corresponding author	M.H. Elnaem
Affiliation	School of Pharmacy and Pharmaceutical Sciences, Ulster University, Coleraine, BT52 ISA, United Kingdom
Email address	m.elnaem@ulster.ac.uk

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