Mapping the artificial intelligence landscape of pharmacology education

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**Introduction.** Pharmacology is a pivotal discipline in health professions and sciences, providing a foundation for developing practical or clinical competencies. However, its educational practice remains hindered by cognitive overload, rigid didactic methods, and limited contextual integration which may foster apprehension among students. Artificial intelligence (AI) may potentially overcome challenges, particularly if underpinned by scientific and educational practice.

**Aims**. The study explored the current AI applications in pharmacology education within various health professions and sciences, and investigated localised perceptions of its use in postgraduate research preparation.

**Methods**. The Joanna Briggs Institute scoping review framework, facilitated by a population-concept-context framework, was used to source literature from Medline, Web of Sciences, Pubmed and Scopus databases. A double- reviewer, blinded review process was used to screen and capture eligible full-text primary research sources. The perceptions of a research department’s students towards a Socratic feedback chatbot implemented for research preparation was investigated through an online survey.

**Results.** Of 391 citations, 25 publications were deemed relevant, with predominant focus on Europe (42.1%) and North America (21.1%), and relation to medical (31.6%) and pharmacy (31.6%) students. The primary overlapping applications comprised teaching (63.2%) and assessment (68.4%), however, curriculum design also featured (31.6%). Thematically, teaching and learning was supported through chatbots, simulations, and clinical case study production, while various assessments were created and/or tested through generative AI. Applications were perceived beneficially and supportive to learning and study outcomes, and promoted assessment practice. However, concerns were raised regarding practitioner confidence, validity, inaccuracy, AI over-reliance, and the inability to articulate nuanced information. In alignment to findings, students appreciated the Socratic chatbot and believed it benefited their preparation, though highlighted potential feelings of being overwhelming with of questioning in their initial exposure to research.

**Discussion.** Although AI holds opportunities for promoting teaching, learning and assessment, perceptual change and faculty development is necessary to promote effective use. AI may streamline educational resource development, however, it does not negate the importance of manual oversight and expert confirmation. Focus should be placed on improving applications validation, promoting appropriate contextualisation and knowledge-base development, and streamlining change management processes to bolster faculty development and empowerment of educators. Development of chatbots is one way t support postgraduate education in research projects, though care should be taken to acknowledge the complexity of broaching a new field that requires human support.