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Health professions education in 2025 – technology push and evolving competencies

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INTRODUCTION

Post 2020, health professions education (HPE) underwent rapid digital expansion driven largely by necessity of the COVID-19 pandemic. Institutions implemented online teaching, provisional assessment adaptations and ad-hoc uses of digital tools. Many of those digital interventions became mainstay changing the HPE landscape forever. It brought many advantages yet issues like systematic curriculum redesign remained addressed inadequately (Grainger, et al., 2024; Htay, et al., 2025). By contrast, 2025 showed a shift toward integration of technology and a move from tool adoption to educational alignment, particularly in areas where medicine, nursing, public health and allied health share competency goals (Nyoni & Asamani, 2025).

Among the technologies, use of Artificial Intelligence (AI) in various pedagogical domains of HPE rose exponentially in 2025 and a shift from it being a supplemental resource to an element requiring structured governance, curricular mapping and rigorous evaluation is observed (Issa, et al., 2024). Similarly, emerging work on blended and experiential models in HPE training illustrates how technological tools are increasingly embedded within broader pedagogical strategies. The year 2025 represented a transition from improvisational innovation in technology toward intentional, programme-level reform and introduced themes of equity and sustainable implementation (Naidu & Ramani, 2024).

AI IN HEALTH PROFESSIONAL EDUCATION

Artificial intelligence (AI) is rapidly reshaping HPE by offering transformative, accessible and scalable opportunities in learning (Feigerlova, et al., 2025). Integrating AI in education has provided personalized learning opportunities with automated feedback and advanced assessment strategies (Hasan & Rahman, 2024). It has been demonstrated that AI can enhance learning in health professions education by adapting educational contents to provide customized learning materials including simulation experience for students (Sriram, et al., 2025; Gomez, et al., 2025). AI has helped in developing intelligent adaptive learning platforms that provide tailored instructions and assessments that could be adjusted according to the students' performance and help in tracking their progress. These platforms have shown improvement in knowledge retention and skill acquisition among students (Feigerlova, et al., 2025). Additionally, generative AI has been very helpful in synthesizing case studies facilitating clinical reasoning practice and simulating patient interactions (McLaughlin, et al., 2025). This helps in providing better understanding along with didactic lectures.

Despite these advantages, recent focus has been on educators to be careful and prevent overreliance on AI as it could erode essential human-centered competencies and ethical judgments (Bulut, et al., 2024). Moreover, there is a need for institutional and curriculum design approaches that strengthen faculty

readiness through improved AI literacy, ethical frameworks, and evidence-informed integration strategies (Issa & Shorbagi, 2024). Future educational frameworks should position AI not as a replacement for human educators but as a collaborative partner that improves learning while preserving core clinical values and competencies (Sriram, et al., 2025).

IMMERSIVE TECHNOLOGY IN HPE

There has been growing evidence that Extended Reality (XR) has the potential to significantly improve health professions education and training by offering healthcare professionals and students immersive and engaging learning experiences that boost comprehension, retention, and performance. Immersive technologies offer unique opportunities afforded by VR, such as ease of repeating scenarios and incorporating diverse patient/clinician avatars, can uphold the medical community's commitment to inclusion, diversity, and equity, unlike traditional manikin-based simulation (Gupta, et al., 2023). While various studies were reported on use of XR, from screen-based VR interventions, use of head-mounted devices (HMD), augmented reality, and in health professions disciplines of healthcare assistant, medical, paramedical, midwifery, etc., the need for consensus of reporting and standardized outcome assessment was highlighted (Chandanani, et al., 2025).

The year 2025 also brought forth the integration of AI and immersive technologies. Reports that AI-driven adaptive systems allow for personalized VR training, which increases engagement and retention of knowledge, while real-time AI feedback enhances decision-making in controlled environments (Chance, 2025). There has been a change in the trend of immersive technologies implemented as isolated innovations, short pilot studies, single-discipline interventions or voluntary supplementary modules towards curricular integration and a broader conceptualisation of what immersive technology can support.

There was more investigation into the educational needs that immersive VR technology can address, such as focusing on cognitive skills, expanding access, and fostering learning through deep immersion. The Unified Theory of Acceptance and Use of Technology (UTAUT), that governs the adoption of new technologies and predicts future technology use was studied aiming for early adopters of immersive technologies like VR. UTAUT described four domains of performance expectancy (user expectation that the technology improves performance), effort expectancy (ease associated with using the technology), social influence (user perception that others believe they should be using the technology), and facilitating conditions (organizational and technological infrastructure for technology implementation). The study showed that early adopters used VR for cognitive gains and are now moving into high-yield educational interventions (Talan, et al., 2025).

EVOLVING COMPETENCIES IN HEALTH PROFESSIONS EDUCATION

Recent surge in digitalization has led to evolution in the expected competencies among HPE graduates. Clinical knowledge and procedural skills remain the foundation for health professionals, however modern health professionals are also expected to be proficient in managing data-driven tools, collaborate effectively with AI systems to improve patient care (El Arab, et al., 2024; Malerbi, et al., 2023). This expanded competency reflects the growing integration of AI and digital health platforms in both education and clinical practice.

Recent literature emphasizes the need of digital literacy as one of the core competencies in health professional curriculum (Hrzic & Buttigieg, 2025: Boshnjaku-Krasniqi et al., 2025; Malerbi, et al., 2023). Health professionals must be trained to use AI efficiently, safely and know its limitations, ethical implications (Love, et al., 2025).

In addition to technical skills, recently emphasis is also laid on competencies in adaptive learning, interprofessional collaboration, and cultural diversities to help the graduates work efficiently in diverse and dynamic healthcare systems (Punzalan & Punzalan, 2025). Hence, HPE graduates must be trained to work collaboratively across disciplines, adapting to new digital health tools, and responding to patient needs with empathy and ethical judgment (Palmquist & Sigurdardottir, 2025; Punzalan & Punzalan, 2025).

Evolving competencies in HPE integrate clinical excellence with digital fluency, ethical awareness, adaptive expertise, and collaborative practice, ensuring a workforce equipped for the future of healthcare.

BLENDED LEARNING IN HEALTH PROFESSIONS EDUCATION

The early pandemic years normalized blended learning, but these efforts were primarily characterized by content migration: recorded lectures, online discussions and intermittent simulation. In the past year, blended instructional design has increasingly used digital tools as pedagogical instruments rather than content repositories. The rise of adaptive learning, AI-supported feedback and structured digital pathways that sit alongside workplace-based learning and simulation has been observed (Feigerlova, et al., 2025)

Blended learning in the past year extended beyond multimodality. It emphasized on progression, learner agency and the integration of digital, simulated and authentic practice environments. The current advancement is the emergence of adaptive blended pathways that personalize learning through analytics while retaining human facilitation and workplace engagement as central determinants of competence (Mulenga & Shilongo, 2025).

FACULTY DEVELOPMENT IN HEALTH PROFESSIONS EDUCATION

Traditionally, health profession education was more faculty-centered, which included didactic lectures and bedside clinical teaching. Recently there was an increased need for a learner-centered environment and digitally enhanced teaching methods (Boshnjaku-Krasniqi, et al., 2025). Educators are now expected to process digital fluency, AI literacy, pedagogical skills, and ethical knowledge along with teaching and clinical expertise. Thus, there is a need for modern faculty development programs that emphasizes on virtual simulation designs, AI integration, knowledge in digital ethics and student-centered teaching methods (El Arab, et al., 2024; Malerbi, et al., 2023; Teferi, et al., 2023). Institutions are also encouraged to adopt interprofessional and international mentorship models to promote collaborative scholarship, inclusivity, and shared digital literacy standards (Punzalan & Punzalan, 2025).

CHALLENGES & OPPORTUNITIES IN THE NEAR FUTURE

Despite the progress of 2025, four challenges remain prominent. First, evidence gaps persist, with most studies still limited to short-term outcomes and learner-reported measures. Second, equity concerns are increasingly visible, especially where access to digital tools varies across institutions and professions. These issues require more robust studies (Jiandani & Supe, 2023). Third, faculty capability is a limiting factor, as educators require structured development in digital pedagogy, analytics interpretation and ethical use of AI. Finally, governance frameworks for data, algorithmic transparency and evaluation of new technologies remain uneven. Addressing these issues will determine whether the current momentum translates into durable educational reform.

Domain diversification, especially of new technologies will be an area to look forward to. For example, the future of VR must include diversification to the areas of psychomotor and affective domain. The

future of immersive technologies, both in HPE education and skills training, must involve its seamless integration with traditional methods (Zeng, et al., 2025) and not aim to replace it.

Resource limitation continues to be a concern for adoption of immersive technologies. However, with rapidly developing technology as well as scale of use, these technologies might become more affordable to use. The development and use of haptics particularly for psychomotor development is an area that will be closely looked at. Future studies on immersive technology would do good to embark on validated assessments for all domains of cognitive, psychomotor and affective as the use-case may be.

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