

Integrating artificial intelligence into clinical technology training: Designing a future-ready curriculum

L T Hazelhurst, MSc

Department of Biomedical Sciences, Faculty of Science, Tshwane University of Technology, Pretoria, South Africa

Corresponding author: LT Hazelhurst (HazelhurstLT@tut.ac.za)

Why was the idea necessary

Clinical Technology, a technology-driven profession, lacks integration of artificial intelligence (AI) into its curriculum. A search on Scopus using 'artificial intelligence' and 'healthcare' revealed that article publications in the medicine subject area have increased by 60% annually over the last three years, with a doubling time of 1.5 years and a prediction of 5 800 articles in 2026. This trajectory means AI capabilities will more than quadruple during a typical four-year degree programme, potentially leaving current Clinical Technology graduates unprepared for AI-enabled clinical practice.

The South African (SA) healthcare context presents unique challenges for implementing AI. The healthcare system faces a dual burden of communicable and non-communicable diseases, limited digital infrastructure, and a shortage of trained faculty. To address these resource constraints and the digital inequality among incoming students, a contextually appropriate framework was developed.

What was tried

The proposed framework was grounded in four categories of sources: *i*) SA professional and regulatory sources, including the Health Professions Council of South Africa (Booklet 20), the South African Health Products Regulatory Authority (MD08-2025/2026), together with key legislation, which anchored the framework in local practice, ethics, and governance requirements; *ii*) international health governance frameworks from the World Health Organization and African Union, which provided global and continental ethical and regulatory framing; *iii*) international education and AI governance frameworks from United Nations Educational, Scientific and Cultural Organization, the Organisation for Economic Co-operation and Development, and the European Union, which shaped the curriculum philosophy, competency progression, and faculty development; and *iv*) academic and pedagogical sources that provided the educational design architecture, assessment scale frameworks, curriculum mapping methodologies, and AI competency models.

The framework employs a four-year progressive structure, with Year 1 establishing digital literacy foundations across six competence areas and Year 2 introducing AI fundamentals, including machine learning, data principles and ethical frameworks. Year 3 develops specialisation-specific AI applications, including disclosure and accountability and Year 4 advances to AI co-creation and system design, preparing students for lifelong learning. Assessment uses the AI Assessment Scale, with five progressive levels ranging from AI-prohibited environments to full AI co-creation.

Table 1. Eight domains of the framework

Domain	Description
1	Curriculum design and foundational principles
2	Pedagogical strategies
3	Competency framework and learning outcomes
4	Specialisation-specific AI integration
5	Regulatory, ethical, and South African contextual considerations
6	Assessment of AI competencies
7	Faculty development and institutional readiness
8	Implementation and Sustainability

What were the lessons learnt

The framework development revealed two critical insights. First, successful AI integration requires progressive scaffolding from digital literacy to advanced competencies, acknowledging the varying levels of digital exposure among SA students. Second, the exponential growth in AI publications necessitates teaching critical evaluation skills over tool-specific training.

The development process yielded eight domains (Table 1). The proposed framework will be validated through an eDelphi study involving expert panel members comprising clinical technology educators, practising clinical technologists, AI specialists, and representatives from regulatory and professional bodies.

Data availability statement. The data for this study is available from the author on request.

Declaration. None.

Acknowledgements. Claude (Anthropic) for conversational assistance and editorial suggestions.

Author contributions. Sole author.

Funding. None.

Conflicts of interest. None.

Received 10 November 2025. Accepted 13 April 2026.

Afr J Health Professions Educ 2026;18(2b):e4473. <https://doi.org/10.7196/AJHPE.2026.v18i2b.4473>