

ASCILITE 2025

Future-Focused:

Educating in an Era of Continuous Change

The AI prescription: Educating future doctors for a tech-driven clinic

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This paper explores the integration of Artificial Intelligence technologies into pre-medical education through a case study of a half-day residential school activity and subsequent focus group discussion. The initiative aimed to enhance students' awareness, confidence, and critical thinking regarding AI-Ts in clinical practice. Using a design thinking framework, students engaged in hands-on exploration of AI applications, scenario-based learning, and collaborative ideation. Focus group findings revealed increased awareness of AI capabilities and limitations, cautious optimism about its use in practice, and a desire for structured AI education. The study highlights the importance of embedding learning opportunities regarding the application of AI-Ts into medical curricula and offers recommendations for future educational strategies aligned with digital innovation in healthcare.

Keywords: artificial intelligence, higher education, design thinking, medicine, focus group, qualitative

Introduction:

The rapid advancement of artificial intelligence (AI) is transforming healthcare and medical education (Alowais et al, 2023). Future doctors will need diverse skills to apply AI effectively in clinical practice (Paranjape et al., 2019), yet many feel unprepared – over 90% of medical students want training to utilise AI effectively in their profession, with up to 71% believing it should be part of medical curricula (Civaner et al., 2022; Pinto dos Santos et al., 2018). Key drivers include technological advancements enabling data-driven decision-making, demand for efficiency and accuracy in healthcare delivery, personalised healthcare approaches, and increasing interdisciplinary collaboration. Despite this recognised need, limited literature exists on multiple medical profession stakeholder perspectives, particularly in the Australian context (Vo et al., 2023).

This paper presents a case study of a residential school activity designed to introduce pre-medical pathway students to AI in healthcare, evaluated through focus groups to explore their perceptions and suggestions. It supports Li & Qin's (2023) call for medical AI education to enhance awareness, enrich curricula through industry-academic collaborations, and address student needs for developing acceptance, utilisation, and discernment of its application.

Methodology:

Residential school design

A review of the Regional Medical Pathway program at a Regional Australian university, where students have an agreed articulation directly into a postgraduate regional medicine program, revealed limited exposure to AI in health practice. To address this, a half-day AI-focused activity was integrated into the 2024 Clinical Diagnostic Microbiology capstone unit. Using the first three stages of the Design Thinking framework - empathise, define, and ideate (McLaughlin et al, 2019) - the session promoted critical, collaborative exploration of AI in clinical contexts. Students engaged in group-based, scenario-driven learning, examining AI tools such as Scanoma – for skin cancer detection, conversational platforms like MedGPT, clinical documentation assistants like Freed, and AI-powered clinical decision support systems like Heidi to assess their potential and limitations. A central case study compared traditional and AI-assisted diagnostic workflows for a respiratory case, prompting analysis of impacts on diagnostic accuracy, efficiency, legal and ethical considerations, and patient outcomes. The session concluded with students proposing AI-driven solutions to significant challenges in regional and rural healthcare in Australia.

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Focus group evaluation

Following the half-day AI activities, two focus groups – one per cohort location – were held under the Chatham House Rule to promote open discussion. Participants explored four key questions related to the session.

- How did the residential school AI activities impact your awareness of AI technologies?
- How did the residential school AI activities impact your confidence in utilising AI-Ts in your future medical practice?
- How are you feeling about the use of AI-Ts in your future medical practice?
- Can you suggest what types of future AI-T associated activities you would be interested in learning about/participating in?

Participants reflected on how the session shaped their view toward AI in clinical practice. Audio recordings were transcribed via Microsoft Teams and manually verified. A transcript-based phenomenological analysis, using both inductive and deductive coding strategies (Braun & Clarke, 2022), identified key themes in student responses. The study was conducted under institutional ethics approval (HREC 25013).

Results:

To contextualise the findings, the structure of the residential school activities is outlined in Figure 1.

BMSC13021 CLINICAL DIAGNOSTIC MICROBIOLOGY	LABORATORY MANUAL
Contents	
AI Residential School for BMSC13017 Clinical Diagnostic Microbiology	4
Title: Exploring AI Technologies in Healthcare	4
I. Introduction to AI in Healthcare (~35mins)	5
1. Welcome and Overview of Workshop Objectives	5
2. Benchmarking Your Understanding of AI-Ts in Australian Healthcare	5
3. Importance of AI in Modern Healthcare	5
4. Interactive Activity: Understanding Different Types of AI-Ts	6
II. Introduction to Clinical Diagnostic Microbiology AI-T (~100 mins)	7
1. Interactive Activity: What do you know about AI-T for Medical Analysis	7
2. Interactive Activity: Using AI Software for Image Analysis (30 mins)	7
3. Demo: AI-powered Clinical Decision Support Systems (50mins)	7
4. Case Studies: Real-world Applications of AI in Clinical Diagnostic Microbiology	7
III. Ethical and Legal Implications for using AI-Ts in Clinical Decision Support (~30 mins)	8
1. Collaboratively brainstorm any ethical and legal implications of using AI-T in clinical decision making.	8
2. Break into small groups and address the key issues.	8
3. Report back on your key areas to the larger group.	8
IV. Design Thinking Workshop: Developing AI Solutions for Healthcare Challenges (~50 mins)	9
1. Introduction to Design Thinking Methodology	9
2. Identification of Healthcare Challenges: Patient Care, Disease Management, Operational Efficiency	9
3. Group Activity: Brainstorming and Ideation Session for AI Solutions	9
4. Presentation of Ideas and Group Feedback	9
V. Reflection and Conclusion (~20 minutes)	10
1. Recapitulation of Key Concepts and Learning Points	10
2. Reflection on Personal Insights and Takeaways	10
3. Join us post-reschool	11

Figure 1. BMSC13021 Clinical Diagnostic Microbiology laboratory manual for the residential school AI activities

The focus group discussions offered valuable insight into how the AI-focused activities shaped students' awareness, perceptions, and anticipated use of AI in their future clinical roles. Results are presented according to the key areas explored during the sessions.

Awareness of AI Technologies

The activity was intentionally designed to broaden students' awareness of AI in healthcare. Many entered with limited knowledge, as reflected by Student 15: *'I was pretty naive to AI beyond ChatGPT ...and that sort of stuff.'* Following the session, students reported significantly increased awareness of AI tools, their availability, governance, and clinical relevance. For instance, Student 2 noted: *'I personally did not know about the amount of apps that use AI.'* Participants also gained insight into critical issues such as algorithmic bias, reliability, and regulatory oversight, including the role of the Therapeutic Goods Administration (TGA). As Student 1 remarked: *'I didn't realise what TGA was legislating [with] AI.'*

A key takeaway was the recognition of quality and reliability challenges in AI diagnostics. Student 3 observed: *'We...saw the quality wasn't great...there was an issue with the imaging itself.'* Students also expressed concern about the rapid pace of AI development and the need for ongoing clinician training: *'You're going to have to start thinking how you're going to train clinicians'* (Student 2). Legal and ethical considerations were also front of mind, particularly around accountability: *'Who's accountable? If something goes wrong with AI, say the patient outcome isn't great'* (Student 6).

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Overall, students demonstrated a deeper understanding of both the opportunities and challenges of integrating AI into clinical practice, with heightened awareness of the importance of regulation and professional responsibility.

Confidence in Using AI

The activity was designed not only to raise awareness but also to encourage recognition of the need for ongoing upskilling in AI use within healthcare. While awareness increased significantly, confidence in using AI tools varied. Students expressed cautious optimism about AI integration, highlighting the importance of structured, continuous training to build competence and trust: *'Training needs to be there'* (Student 5). Participants acknowledged AI's potential to enhance clinical decision-making and reduce workload, offering future clinicians a sense of support and efficiency. However, they also noted that genuine confidence requires more hands-on experience with real-world tools.

Confidence was found to be context-dependent, shaped by individual familiarity with technology and the specific medical specialty. Students stressed the need for access to trustworthy resources: *'There's a lot of...resources available, but [you need to] know which ones are more reliable than others to include in your education'* (Student 2). They also reflected on the challenge of maintaining integrity when using AI, recognising a gap between understanding how AI works and applying it responsibly: *'AI, knowing how it works...it's difficult, but using it in itself doesn't sound that difficult'* (Student 14).

Attitudes Toward AI in Future Practice

The activity was designed to prompt students to consider how AI integration might shape their future careers. Students expressed a mix of excitement and concern, with Student 12 summarising this tension: *'I feel like it's ...a double-edged sword.'* While many saw AI as a valuable support tool—enhancing efficiency, reducing costs, and improving access, especially in rural settings—others raised thoughtful reservations.

Several students viewed AI as a complementary aid rather than a replacement: *'AI is just going to be an additional layer that's going to help me with my work—then that's definitely going to be a positive'* (Student 2), and *'more efficient and...could make things cost less...[and]...more access for people'* (Student 13). Student 6 noted a division of labour: *'All the admin work...done by AI...but the more interesting stuff like actually diagnosing the patient...that's still gonna be our job.'* Whilst Student 15 captured the general optimism: *'It sounds really exciting...helps you find the balance between cognitive ability and spreading out the workload.'*

However, concerns emerged around over-reliance on AI and its potential to undermine clinical independence and critical thinking. Student 14 warned: *'If people lose how to think for themselves, then AI will just get more and more behind.'* Others questioned the quality and bias of AI training data and its implications for diagnostic accuracy and patient care. There were also concerns about AI diminishing the creative and satisfying aspects of clinical reasoning: *'are you taking my creative thinking work?'* (Student 14), and *'we take pride in thinking for ourselves...[we might]...lose a little satisfaction...[if we become]...like a medium between a patient and an AI chat'* (Student 17).

Students also reflected on how AI might influence career choices, with Student 8 noting: *'It'll put more people into certain other fields... and put more pressure on entrances for other specialties.'* Broader equity concerns were raised, particularly regarding access in underserved areas: *'In a remote location'* (Student 5) and *'without internet access'* (Student 7), highlighting fears that AI could widen existing healthcare disparities.

Suggestions for Future Learning

Participants proposed a range of thoughtful recommendations for integrating AI into medical education. They advocated for embedding foundational AI concepts within existing curricula, rather than offering standalone courses. For example, Student 15 suggested aligning AI examples with clinical topics: *'Like last term we learned*

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about skin cancers and how to differentiate.’ Student 2 added: ‘Not full-blown courses, but integrated examples.’

Recognising the rapid evolution of AI, students called for ongoing learning opportunities through regular workshops, emphasising the value of practical, scenario-based training, on AI used in healthcare. Students called for dedicated modules on AI governance, ethics, and regulatory compliance to build a well-rounded understanding of responsible AI use in healthcare. A strong curricula development theme was the importance of involving ‘*all the different stakeholders*’ (Student 3) - patients, hospital representatives, and AI developers - in future educational activities to provide broader perspectives on implementation challenges and opportunities. Collaboration between medical students and AI developers was seen as key to bridging the gap between clinical needs and technological innovation.

Discussion:

The findings align with existing literature underscoring the urgent need to integrate AI education into medical curricula. They support calls for flexible, embedded learning opportunities that prepare pre-medical students for the rapid evolution of AI in healthcare - particularly through identifying core competencies, developing case-based learning, leveraging experiential approaches, and incorporating multi-stakeholder perspectives (Li & Qin, 2023; Hu et al., 2022). This study extends prior research (Author 1 et al, 2024) from regional medical stakeholders and student cohorts, reinforcing the demand for AI-focused training that enhances career readiness in an AI-augmented healthcare environment.

Students demonstrated a clear willingness to engage with AI but highlighted the need for structured support to build confidence and competence. The use of a design thinking framework effectively facilitated critical exploration, collaborative ideation, and engagement with diverse perspectives.

Key challenges identified include the difficulty of integrating AI content into already dense medical curricula without adding undue burden and the need to comprehensively address ethical, legal, and regulatory complexities surrounding AI use in healthcare.

The fast-paced nature of AI development presents ongoing difficulties in maintaining up-to-date educational content. These challenges echo concerns raised in recent literature by both students (Krive, 2023; Jha et al., 2022; Pucchio et al., 2022) and broader healthcare stakeholders (Kuo et al., 2024; Mansour et al., 2024; Yelne, 2023). As AI technologies continue to reshape healthcare delivery, medical education must remain agile and responsive to ensure future clinicians are prepared for ongoing change.

Opportunities for advancement include supporting student-led learning initiatives, fostering interdisciplinary collaboration between medical and technology disciplines and developing innovative assessment strategies that evaluate both technical proficiency and critical thinking in AI application.

Conclusion and Recommendations:

This case study highlights the value of integrating AI-focused education into pre-medical training. Key outcomes include increased student awareness of AI applications and limitations, the development of cautious yet informed confidence, and a strong desire for structured, ongoing AI learning.

Key recommendations include embedding AI education throughout medical curricula rather than as standalone modules, incorporating scenario-based assessments that evaluate both technical skills and critical thinking, and involving diverse stakeholders in educational design. Future strategies should emphasise continuous learning to keep pace with rapid advancements, foster interdisciplinary collaboration between medicine and technology, and strengthen ethical and regulatory literacy to support responsible AI integration in healthcare.

These approaches support technology-enhanced learning and prepare students to navigate the evolving landscape of AI-augmented healthcare, equipping them to meet both the opportunities and challenges of future clinical practice.

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