

Large Language Models in Medical Education

2nd Annual Global AI in Healthcare Conference

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Mid and South Essex
NHS Foundation Trust

BACKGROUND

Medical students demanded more facilitated revision as finals approached. The Broomfield CTF programme trialled an AI-assisted Single Best Answer (SBA) session — generating 50 high-fidelity questions mimicking the MS AKT. The entire preparation took under 10 minutes, highlighting AI's practical potential in medical education.

ABSTRACT

LLMs are potentially transformative tools for medical education — supplementing traditional learning, enabling rapid creation of tailored study materials, and supporting students in resource-limited or time-constrained settings. Careful implementation and continuous evaluation are essential to ensure effective and ethical adoption.

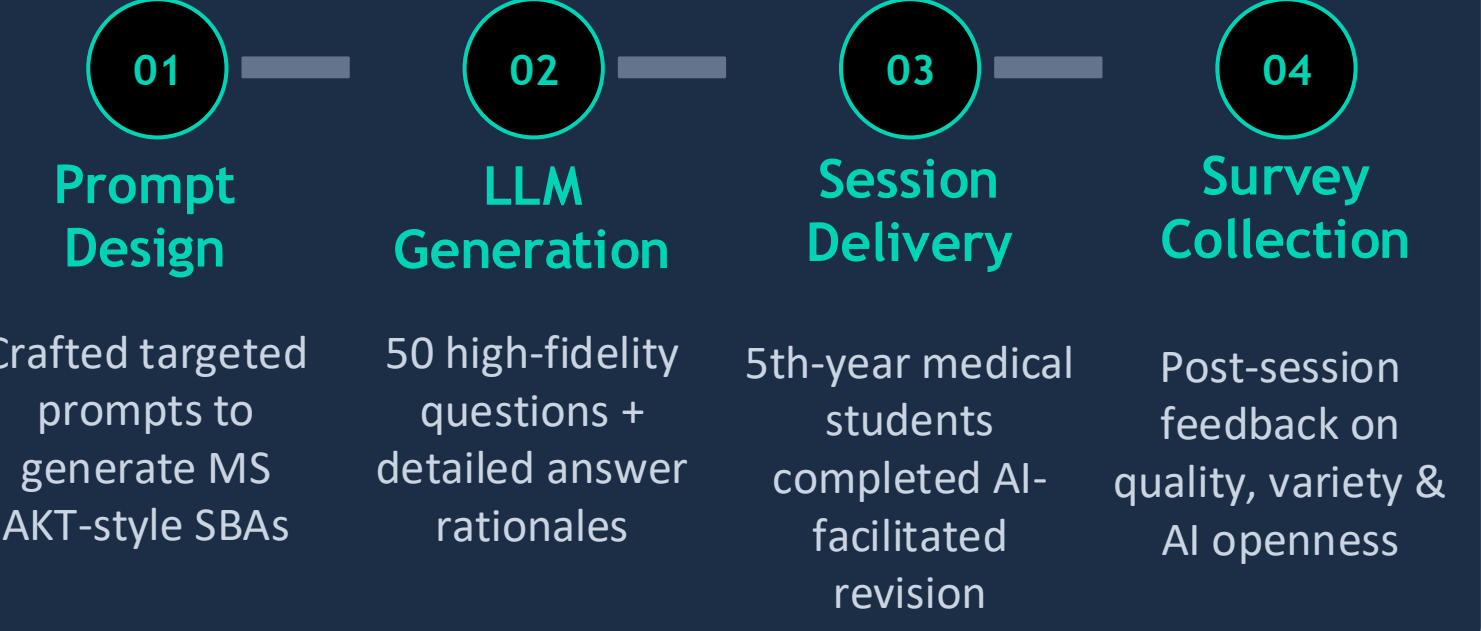
LLM CAPABILITIES

- Virtual Tutoring**
Instant, personalised explanations adapting to each student's level and gaps
- Content Generation**
50 high-fidelity SBA questions produced in minutes — quality on par with paid banks
- Clinical Simulation**
Safe low-risk patient interaction scenarios to build clinical reasoning
- Admin Automation**
Feedback, grading & prep tasks automated — freeing educator time entirely

CHALLENGES & ETHICS

- Accuracy**
AI can hallucinate — verified medical knowledge sources essential
- Bias**
Training data biases may create disparities across demographics
- Data Privacy**
Must comply with student data protection regulations
- Over-Reliance**
AI complements — never replaces — critical clinical thinking
- Environment**
Each ChatGPT query uses ~5x more energy than a web search

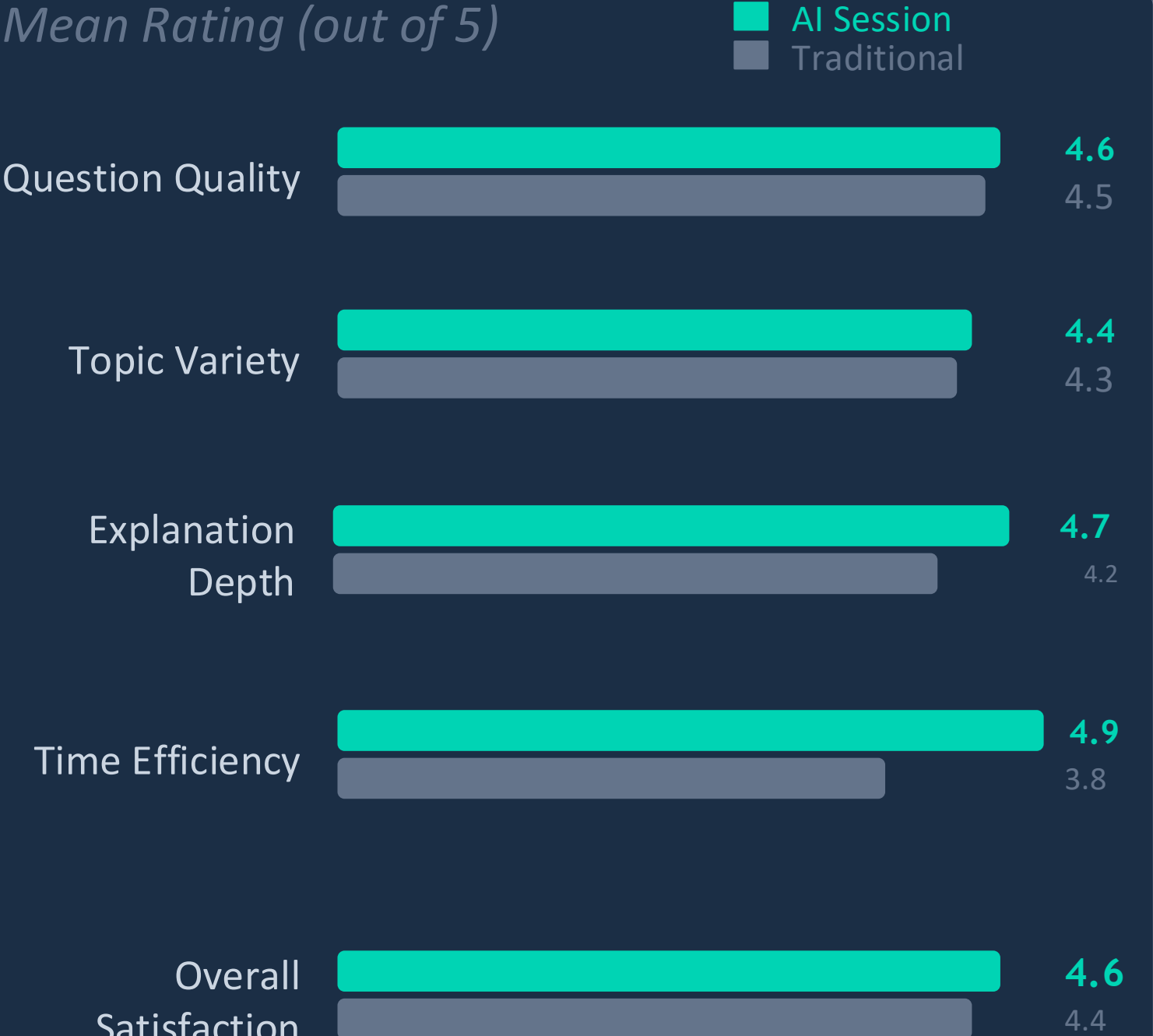
METHODS



KEY RESULTS



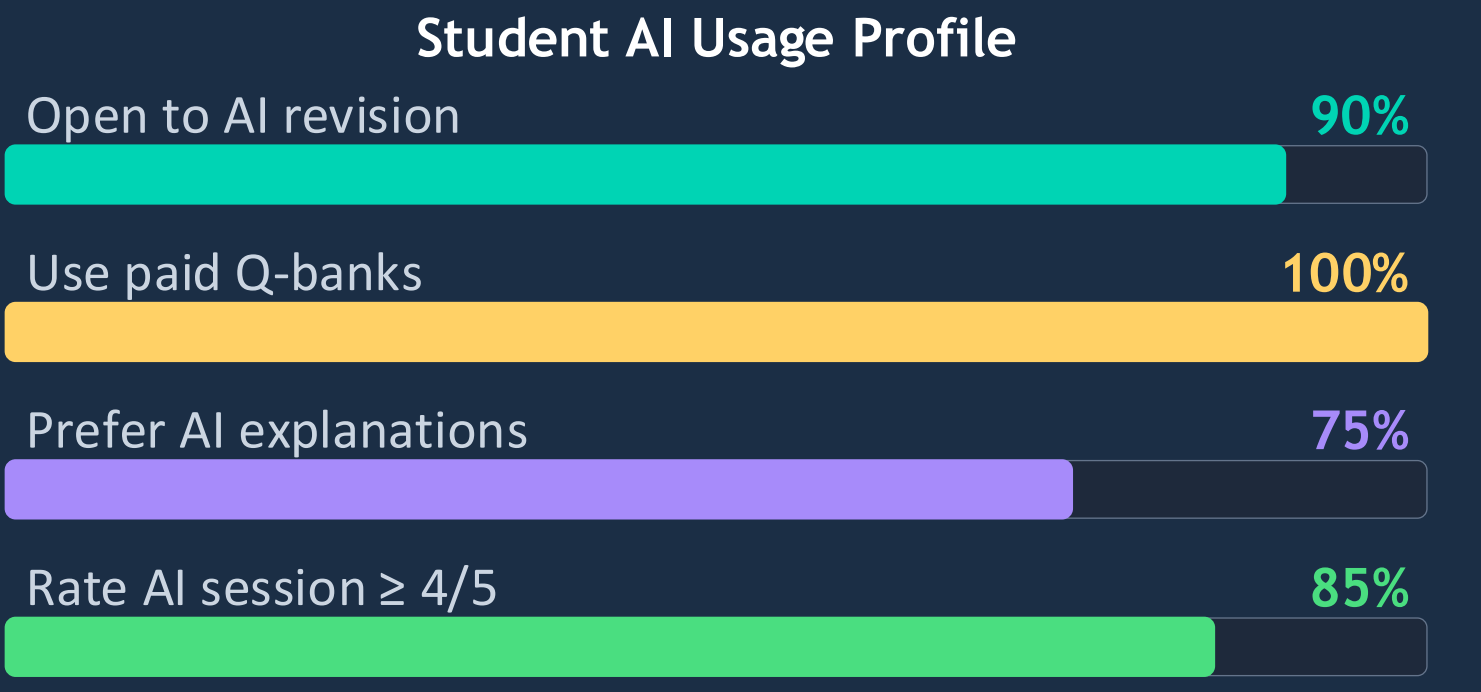
STUDENT FEEDBACK (VS TRADITIONAL BANKS)



BENEFITS OF AI IN MEDICAL EDUCATION

- Accessibility**
High-quality resources for remote & under-resourced students worldwide
- Efficiency**
Content, quizzes & admin tasks automated — prep under 10 minutes
- Personalisation**
Adaptive materials tailored to performance gaps and individual learning styles
- Scalability**
Simultaneous support for thousands of learners — democratising education

AI ADOPTION SNAPSHOT



QUALITATIVE FINDINGS

- "Efficient — comparable to top-tier paid question banks"
- "Explanations were more detailed than any resource I've used"
- "Topics felt clinically relevant and well-targeted to finals"
- "I would absolutely recommend this to other medical students"

FUTURE DIRECTIONS

- Near-Term (2025-2026)**
 - Scale pilot to larger cohorts across multiple hospitals and medical schools
 - Conduct RCT comparing AI-generated vs traditional SBA sessions on exam performance
 - Develop validated prompt libraries for consistent, high-quality question generation
 - Integrate LLMs into existing VLE platforms (e.g. Moodle, Canvas)
- Medium-Term (2026-2028)**
 - AI-driven adaptive curricula personalised to individual student knowledge gaps
 - Real-time formative assessment with instant, actionable AI feedback loops
 - LLM-powered case-based learning with branching clinical scenarios
 - Automated marking and performance analytics for educators
- Long-Term (2028+)**
 - AR/VR patient simulations powered by AI for immersive, risk-free clinical training
 - Multimodal AI integrating imaging, history-taking & diagnosis in unified platforms
 - Global open-access AI education hubs bridging resource inequality worldwide
 - AI co-authoring of dynamic, continuously updated medical textbooks & guidelines
- Research Priorities**
 - Larger sample RCTs measuring long-term learning outcomes
 - Bias audits across demographic and specialty subgroups
 - Cost-benefit analysis of AI vs traditional resource spend
 - Ethical frameworks for AI use in high-stakes assessment
- Conclusion**

LLMs hold immense potential to revolutionise medical education — augmenting traditional methods, fostering efficiency, and enhancing interactive learning. Careful implementation, continuous evaluation, and a commitment to equity are essential to realise this potential ethically and at scale.