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# Alliance of Academic Health Centers International (AAHCI) Student Leadership Initiative (ASLI)

## *AI in Health Professions Education*

## BACKGROUND

The AAHCI Student Leadership Initiative (ASLI) was created to challenge health professions students at academic health centers to submit proposals sharing new ideas or innovative programs tackling key topics in health professions education.

In 2020, AAHCI launched the ASLI with the leadership of the AAHCI Latin America and the Caribbean (LAC) Regional Office host, University of São Paulo. The first two rounds of ASLI were focused on LAC and the topics of "Virtual Medical Education" (2021) and "The Convergence of Climate Change and Health Professions Education" (2022).

With support from AAHCI regional offices, AAHCI launched the ASLI program in 2024 to the entire AAHCI community with the theme of "Innovative Interprofessional Education (IPE) Models and Programs."

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AAHCI launched the ASLI program for the 2024-2025 membership year to the entire AAHCI and AAMC community with the theme of "AI in Health Professions Education."

Students were invited to share proposals that highlight new ideas or existing innovative programs, models, or studies that achieve at least one of the following:

- Inspires research and innovation in artificial intelligence (AI) to address new challenges in health professions education.
- Addresses the impact of AI on professionalism, patient care, and/or patient safety.
- Encourages academic health centers to promote and develop innovative programs and models that integrate AI into the health professions.

This compendium is a compilation of 45 abstracts submitted from students at the following participating institutions:

- The Aga Khan University (Kenya)
- Cleveland Clinic Abu Dhabi (UAE)
- College of Medicine, University of the Philippines Manila (Philippines)
- Faculty of Medicine, University of Colombo (Pakistan)
- Faculty of Medicine, University of São Paulo (Brazil)

- Faculty of Nursing, University of Colombo (Sri Lanka)
- Hackensack Meridian School of Medicine (USA)
- Jacobs School of Medicine and Biomedical Sciences at the University at Buffalo (USA)
- Lithuanian University of Health Sciences (Lithuania)
- Medical College of Wisconsin (USA)
- Mohammed Bin Rashid University of Medicine and Health Sciences, Dubai Health (Dubai)
- Perelman School of Medicine at the University of Pennsylvania (USA)
- Syarif Hidayatullah State Islamic University Jakarta (Indonesia)
- Universiti Malaya (Malaysia)
- University Medical Center Göttingen (Germany)
- University of California, Davis, School of Medicine (USA)
- University of Missouri - Columbia School of Medicine (USA)
- University of Nebraska Medical Center (USA)
- University of Oklahoma College of Medicine (USA)
- University of Utah Health System (USA)
- VinUniversity (Vietnam)

The first eight abstracts in the compendium are those selected as finalists by the review committee. The authors provided presentations on their ideas in an ignite-style session held virtually.

*The **AAHCI Student Initiative Ignite! Talks** (virtual program) from 2025 can be viewed online.*

# Innovative Interprofessional Education (IPE) Models and Programs

## AAHCI Regional Members

## *Submission Abstracts*

## FINALISTS*

**Indicated with a yellow star.*

***Design Quest: AI-based simulation tool for teaching design-thinking at medical university**,* Liko Lu Qi, Year 1 MBBS Student; Anna Berbenyuk, Advisor; and Yacine Hadjiat, Advisor (Mohammed Bin Rashid University of Medicine and Health Sciences, Dubai Health, UAE)

***An Interlinked Approach for Beneficial and Reflected Artificial Intelligence Use in Clinical Context**,* Hannah Bruex, Medical Student; Michael Schütte, Medical Student; and Wolfgang Brück, Advisor (University Medical Center Göttingen, Germany)

***Artificial Intelligence, Medical Practice & Protected Groups: Implications for Medical Education**,* Akorfa Adobor, Medical Student, and Philisha Mesidor, Medical Student (Medical College of Wisconsin, USA)

***Fighting by promoting: transforming the medical education study process and assessments with AI**,* Martynas Burneikis, Medical Student; Kėja Dvilaitytė, Medical Student; Gabija Grinaitė, Medical Student; Justas Kvietinskas, Medical Student; Gvidas Urbonas, Advisor; and Aušra Urbonienė, Advisor (Lithuanian University of Health Sciences, Lithuania)

***Turmerik: Building the AI-Driven Framework for Global Clinical Trial Diversity**,* Amanda Moser, Medical Student, and Ayushi Sinha, MBA Student (Perelman School of Medicine at the University of Pennsylvania, USA)

***From Theory to Practice: AI-Enabled Case Simulations for Health Professions Students**,* Amarpreet Mahil, Medical Student (Medical College of Wisconsin, USA)

***AI for Adaptive Emotional Intelligence Training in Nursing Education**,* Ama Gunasekara, Nursing Student; Navya Alwis, Nursing Student; Thanusha Demel, Nursing Student; Lohitha Ruhunage, Nursing Student; and M.W. Nilushi Nisansala, Advisor (Faculty of Nursing, University of Colombo, Sri Lanka)

***MAESTRO: Mobilization Through AI-Driven Epidemiological Surveillance, Tracking, and Risk Optimization for One Health Leadership**,* Jeremy Ace F. Ng, Medical Student, and Emma Gabrielle Alessandra A. Panopio, Medical Student (College of Medicine, University of the Philippines Manila, Philippines)

## SUBMISSIONS

***Revolutionizing Medical Education: AI-Powered Statistical Training for Medical Student Research,*** Yijin Huang, Medical Student (University of Missouri-Columbia School of Medicine, USA)

***AI-Driven Curriculum Enhancement: Transforming Student Learning in the Health Professions,*** Andrew Hojjat, Medical Student (University of Oklahoma College of Medicine, USA)

***Bridging Cultures, Building Skills: A Virtual Patient Simulator for Culturally Competent Clinical Reasoning,*** Sameer Asim Khan, Medical Student; Humza Iqbal Rathore, Medical Student; Fawaz Shefeek Mohammed, Medical Student; Jamal Taiyara, Medical Student; and Lisa Jackson, Advisor (Mohammed Bin Rashid University of Medicine and Health Sciences, Dubai Health, UAE)

***AI Integration to Medical Research Learning in Syarif Hidayatullah State Islamic University Jakarta: Survey on Students' Readiness,*** Aisya T. P. Wigati, Medical Student; Aurick Yaafi, Medical Student; Muhammad Rafi Arifiansyah, Medical Student; Beka Salima Dewi Maharani, Medical Student; Fika Ekayanti, Advisor; and Marita Fadhilah, Advisor (Syarif Hidayatullah State Islamic University Jakarta, Indonesia)

***AI-Driven Mirror Therapy Application for Limb Amputation Rehabilitation,*** K.G.D.S. Thilakarathna, Operation Theater Nurse; M.S. Abeywickrama, Nursing Lecturer; K.A.I.L. Kuruppu, Nursing Lecturer; and D.H. Somadasa, Nursing Lecturer (Faculty of Nursing, University of Colombo, Sri Lanka)

***AI-Enhanced Diagnostic Kit for Early Detection and Personalised Management of Challenging Diseases,*** Sajad Jamal Pour and Fatemeh Abaei (Universiti Malaya, Malaysia)

***Building Bridges to Better Hearts: A Proposal for Utilizing Artificial Intelligence (AI) in Heart Failure Bridge Clinics to Reduce Hospitalization and Readmission Rates,*** Noora Alhajri, Internal Medicine Resident (Cleveland Clinic Abu Dhabi, UAE)

***Education on Assistive AI,*** Ivy Pham, Medical Student (University of California, Davis, School of Medicine, USA)

***Removing racism: The role of AI in detaching discrimination from medical education,*** Lukman Hassan Hallaj Shafi Vedaralalage, Medical Student, and Ruvaiz Haniffa, Advisor (Faculty of Medicine, University of Colombo, Pakistan)

***An Interactive Gamified Platform with Artificial Intelligence for Orthopedic Education: A Proposal for Innovation,*** Vitor Matheus Silva, Medical Student (Faculty of Medicine, University of São Paulo, Brazil)

***Custom Conversational Agents for Clinical Reasoning Education,*** Tuyet Thao Nguyen, Medical Student; Katherine Guo, Medical Student; and Eric Signoff, Advisor (University of California, Davis, School of Medicine, USA)

***Developing an Interprofessional Reflection App,*** Samindi Upeka Malalagama, Undergraduate Student; Imesha Chathumini, Undergraduate Student; and Sasindu Pravishka Fernando, Undergraduate Student (Faculty of Nursing, University of Colombo, Sri Lanka)

***Enhancing Medical Education with AI in Histopathology Image Interpretation,*** Brian Weru Komu, Medical Student; Sarah W. Wambugu, Medical Student; Ciano W. Ng'ang'a, Medical Student; and Peter O. Micha, Medical Student (The Aga Khan University, Kenya)

***Bringing Medicine to Life: The Role of Virtual and Augmented Reality in Medical Education,*** Ivy W. Mwaura, Medical Student; Rebecca M. Mutie, Medical Student; and Ummikulsum F. Parpia, Medical Student (The Aga Khan University, Kenya)

***Creation and Evaluation Frameworks for AI-Guided Clinical Simulation,*** Ivy Pham, Medical Student (University of California, Davis, School of Medicine, USA)

***Harnessing AI to Assess Donor Liver Steatosis: Transforming Transplantation and Patient Outcomes,*** Eglė Juškevičiūtė, Medical Student; Ignas Lapeikis, Medical Student; and Povilas Ignatavičius, Advisor (Lithuanian University of Health Sciences, Lithuania)

***Enhancing Anesthesia Education and Patient Safety Through Artificial Intelligence Integration,*** David D. De Araujo, Medical Student (Faculty of Medicine, University of São Paulo, Brazil)

***Exploring Filipino Medical Students' Attitudes and Perceptions of Artificial Intelligence in Medical Education: A Mixed-Methods Study,*** Robbi Miguel G. Falcon, MD-PhD Student (College of Medicine, University of the Philippines Manila, Philippines)

***"Think-Tank" Education Model: A Collaborative Research-Focused Approach to Artificial Intelligence Education,*** Danielle Kong, Medical Student (Hackensack Meridian School of Medicine, USA)

***Personalized AI for Lifestyle Change: Improving Patient Outcomes Through a Medical Record-Based AI Tool,*** Anna M. Szombathy, Medical Student (Jacobs School of Medicine and Biomedical Sciences at the University at Buffalo, USA)

***Developing AI Competence for Health Professions Students,*** Jensen Antilla, Student, and Nancy E. Krusen, Program Director and Professor (University of Nebraska Medical Center, USA)

***Enhancing Patient Outcomes in Neurosurgery: Machine Learning for Predictive and Preventive Care,*** Philisha Mesidor, Medical Student, and Akorfa Adobor, Medical Student (Medical College of Wisconsin, USA)

***Complex approach for military servicemen dental care provision based on AI-driven diagnostics technologies: perspective for practice and education,*** Yaroslava Zaverukha, PhD Student, and Myroslav Goncharuk-Khomyn, Advisor (Lithuanian University of Health Sciences, Lithuania)

***Enhancing Diagnostic Accuracy: A Comparative Study of ChatGPT-4o and Traditional Medical Knowledge in Generating Differential Diagnoses Among Philippine General Hospital (PGH) Surgeons,*** Katrina Francesca Yap Asedillo, Medical Student; Julio Rafael M. Nakpil, Medical Student; and Jan Francois B. Severo, Medical Student (College of Medicine, University of the Philippines Manila, Philippines)

***AI-based cardiovascular surgery training system integrating virtual reality (VR) and augmented reality (AR) among medical students,*** T.A.M.H. Samanmalee, Nursing Student; K.N. Thalgaspitiya, Nursing Student; G.S. Sewwandi, Nursing Student; and S.B.H. Sudeshika, Nursing Student (Faculty of Nursing, University of Colombo, Sri Lanka)

***Enhancing Medical Education through Integrating ChatGPT into Virtual and Augmented Reality Platforms for Real-Time Assistance,*** Debra K. Kioli, Medical Student (The Aga Khan University, Kenya)

***Leveraging Artificially Intelligent Chatbots for Improving Empathetic Communication Skills in Medical Students,*** Anthony Peterson, Medical Student (Hackensack Meridian School of Medicine, USA)

***AI-Powered Ethical Dilemma Simulation for Medical Education: Enhancing Decision-Making in Real-Time,*** Mohammed Amaan Khokar, Medical Student; Muhammad Kumail, Advisor; and Yacine Hadjiat, Advisor (Mohammed Bin Rashid University of Medicine and Health Sciences, Dubai Health, UAE)

***Bolstering AI Models by Improving Dysarthria Databases,*** Russell B. deJesus, PhD Student (University of Utah Health System, USA)

***AI-Powered Learning Material Optimization for Medical Education,*** Linh Bao Luu, Medical Student (VinUniversity, Vietnam)

***Comparing Virtual Simulation and Traditional Hands-On Simulation in Medical Education,*** Teresa W. Ndung'u, Student (The Aga Khan University, Kenya)

***AI Linked Noninvasive Blood Analyzer For Health Professional Education,*** P.W.G. Ashini Vindya Jayathilaka, Nursing Student; A. Sanduni Kaushalya Perera, Nursing Student; K.B. Yehan Pasindu Dharmasena, Nursing Student; K.G. Dasun Darshana, Nursing Student; and M.W. Nilushi Nisansala, Advisor (Faculty of Nursing, University of Colombo, Sri Lanka)

***AI-Driven Consultation Feedback System for Orthopedic Medical Training: Enhancing Clinical and Communication Skills,*** Vitor Matheus Silva, Medical Student, and Tiago Lazzaretti Fernandes, Advisor (Faculty of Medicine, University of São Paulo, Brazil)

***The appliance of AI tools for improving professional communication skills in medical education,*** Eimantas Peičius, Medical Student; Eline Alice George, Medical Student; Anugraha Jojy, Medical Student; Johanna Felicia Wahlstrom, Medical Student; Frida Gonzalez Gonzalez, Medical Student; and Eimantas Peicius, Advisor (Lithuanian University of Health Sciences, Lithuania)

***Developing a Pedigree analysis AI tool within a hospital Electronic Health Record system,*** H.M.M. Sachini Lakshika Herath, Undergraduate Student; A.R.M. Chamari Asangika Kumari Alawathupitiya, Undergraduate Student; H.W. Piyumi Madurika Kumari, Undergraduate Student; and Anushka S. Elviitigala, Advisor (Faculty of Nursing, University of Colombo, Sri Lanka)

***Integration of AI in the Speedwell Exam System for Automated Essay Grading,*** Brian Weru Komu, Medical Student; Sarah W. Wambugu, Medical Student; Peter O. Micha, Medical Student; Brian M. Maina, Medical Student; and Ciano W. Ng'ang'a, Medical Student (The Aga Khan University, Kenya)

***Leveraging AI for Personalized Learning in Medical Education,*** Rodrigo D. Martins, Medical Student; Vitor L. Paiva, Medical Student; João V. Calil, Medical Student; and Gabriela E. D'Eugenio, Medical Student (Faculty of Medicine, University of São Paulo, Brazil)

***Impact of an AI Study Bot on Biomedical Science Student Learning,*** Ciano W. Ng'ang'a (The Aga Khan University, Kenya)

***AI-Enhanced Virtual Reality Classroom for Health Profession Education: Overcoming challenges in treating patients with highly contagious diseases,*** Ruchini Thathsarani Wijerathne, Nursing Student; Kanishka Madhavi Gampalage, Nursing Student; Pubudu Malshan Samaranayaka, Nursing Student; and M.W. Nilushi Nisansala, Advisor (Faculty of Nursing, University of Colombo, Sri Lanka)

# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Design Quest: AI-based simulation tool for teaching design-thinking at medical university*

*Mohammed Bin Rashid University of Medicine and Health Sciences (UAE)*

AUTHORS

Liko Lu Qi, Year 1 MBBS Student

## PURPOSE

The rapidly evolving healthcare landscape demands professionals capable of integrating clinical expertise with innovative problem-solving, empathy, and adaptability to complex challenges. However, traditional medical education frameworks often fall short in preparing future clinicians for such demands, particularly in teaching Design Thinking (DT)—a human-centered, iterative approach to problem-solving. Current methodologies frequently reduce DT to a didactic process, limiting its experiential and practical value. To address this gap, an AI-driven digital simulation platform Design Quest was introduced. It is designed to immerse medical students in realistic, evolving healthcare scenarios. By guiding learners through the five core stages of DT—empathize, define, ideate, prototype, and test—it provides an experiential approach that promotes creativity, empathy, and critical thinking. This innovative platform prepares healthcare professionals to deliver patient-centered, contextually relevant care and equips them to address multifaceted healthcare needs in a globalized world.

## INNOVATION

Design Quest revolutionizes DT education by integrating advanced artificial intelligence with interactive, digital simulations that mimic real world healthcare challenges. The platform's scenarios dynamically adapt to student decisions, ensuring unique, personalized learning experiences. Through its emphasis on practical application, it bridges the gap between theoretical DT concepts and their real-life clinical applications, such as optimizing patient intake processes, enhancing chronic disease management, or redesigning care protocols.

Key features include:

- AI-Driven Narratives: Adaptive algorithms tailor scenarios in response to student inputs, requiring ongoing refinement of strategies as new information emerges.
- Interactive Learning: Real-time feedback helps students reflect, iterate, and improve their decision-making processes, fostering continuous growth in their problem-solving abilities.
- Scalable Design: The platform's flexible, cloud-based infrastructure allows seamless integration across institutions, standardizing DT education and expanding accessibility to learners worldwide.

By contextualizing DT within healthcare settings, Design Quest transforms learning into an engaging, impactful experience that prepares students to navigate real-world challenges with creativity, confidence,

and resilience. The inclusion of real-time, scenario-based adaptations ensures students gain practical experience that mirrors the unpredictability of real clinical environments.

## IMPACT

SimProgress seeks to redefine medical education by providing scalable, culturally responsive, and collaborative learning experiences. Its localized, adaptive design empowers students to address diverse healthcare needs while fostering empathetic, patient-centered care in multicultural environments. By enabling international collaboration, the platform promotes knowledge exchange and innovation, driving global advancements in healthcare education and practice.

Key deliverables include:

- A fully operational Design Quest platform featuring complexity-graded scenarios aligned with DT stages, enabling progressive learning.
- Quantitative and qualitative performance metrics assessing DT mastery and clinical reasoning improvement over time.
- Feedback reports evaluating user satisfaction, usability, and educational impact to ensure iterative enhancements.
- Peer-reviewed publications disseminating findings on digital simulation integration in DT education to advance the academic discourse.
- Educational materials to guide curriculum integration and scale implementation across institutions worldwide, ensuring sustained impact.

By equipping students with the tools to tackle modern healthcare challenges, Design Quest fosters the development of innovative, compassionate, and adaptable healthcare professionals. Its transformative approach aligns with the ASLI mission to inspire research and educational advancements, setting a new benchmark for preparing clinicians to excel in a complex global healthcare landscape.

# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*An Interlinked Approach for Beneficial and Reflected Artificial Intelligence Use in Clinical Context*

*University Medical Center Göttingen (Germany)*

AUTHORS

Hannah Bruex, Medical Student; Michael Schütte, Medical Student

## PURPOSE

Artificial intelligence (AI) is nowadays becoming a widely accessible tool, which people tend to use to research information and support decisions. Several tools for the usage of AI in specific clinical contexts have been proposed^1,2, but also the usage of AI as a diagnostic assistant in wider clinical contexts must be noted. Considering that an AI tool cannot be trained with all possible data regarding a patient and clinical setting and can only compile scale-based data, the ethical challenges of the usage of AI must be discussed in the training of health care professionals. Furthermore, AI can be prone for bias and suggest wrong solutions. Therefore, medical professionals have to develop a deep understanding of the implications of the integration of AI into various clinical fields, starting in their preclinical training^3.

## INNOVATION

We propose a longitudinal curriculum consisting of three modules solely focusing on general aspects of AI, the challenges, and the usage at the beginning, whereas in the middle and at the end of clinical training it would be integrated in general clinical skill training. The learned skills should be further improved on and used during some normal case based training sessions throughout all years of medical school education. Teaching methods employed will be group discussions, case simulations and snowballing. The first session with the goal of raising awareness for the usage of AI in a clinical context and discussing possible strategies to react to mistakes made by AI: Students will be presented to a short overview of AI usage in clinical context established so far and the ongoing debates about it. As a foundation for further progress a survey will be conducted to their at-the moment stance on using AI and their expectations. In small groups students will now be presented prepared AI Answers for clinical cases that are either obviously right or wrong to foster discussion about possible strategies to distinguish those. In the following clinical modules, prepared AI solutions will be presented to the students while getting more difficult to distinguish between correct and false. Implications for patient care will be debated. This should include ethical challenges such as wrong AI recommendations due to biased training samples in dermatology. In the following group training sessions, students will be asked to develop prompts for AI themselves being given a complex case and are to use different techniques (e.g., focusing on the key-findings or giving detailed descriptions of every single diagnostic employed). Their results will be discussed and evaluated together with a clinician familiar with the case. This format could potentially be included in most of the specialties. Furthermore, a case could specifically be developed for ethical teaching (e.g., evaluating AI suggestions in a triage situation).

## IMPACT

By establishing an interlinked approach to clinical setting with AI as wells as clinicians, future health care professionals will be enabled to decide whether to use AI in a specific clinical context, as well as to reflect on AI based suggestions and ultimately to sustainably use AI for the benefit of the patients.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Artificial Intelligence, Medical Practice & Protected Groups: Implications for Medical Education*

*Medical College of Wisconsin (USA)*

AUTHORS

Akorfa Adobor, Medical Student; Philisha Mesidor, Medical Student

## PURPOSE

Medical education must prepare future physicians to navigate the challenges of Artificial Intelligence (AI) in medical practice, especially regarding vulnerable and historically disadvantaged groups. AI, encompassing technologies like Machine Learning (ML), Natural Language Processing (NLP), and robotics, has shown great potential in enhancing medical fields such as diagnostics, digital medicine, clinical trials, and surgery[1], [2]. However, the inherent biases in AI, stemming from the underrepresentation of minority groups in training datasets, pose significant risks. First, ML models are often trained on biased datasets derived from health records and clinical registries, where minority representation is limited due to historical mistrust and under-participation in clinical trials[3], [4]. Second, algorithms trained on historical data can perpetuate existing disparities, as noted by the American Medical Association[5], [6]. Third, equity and fairness concerns emerge because ML algorithms may not be as effective for minority populations due to insufficient training data. Finally, at a more general level, the evolving nature of AI and its potential for overreliance in medical practice present risks, particularly with diagnostic tools like Deep Learning (DL), whose accuracy remains uncertain[7]. When applied to vulnerable groups, medical education is critical in addressing these limitations and equipping students with knowledge of AI's potential and pitfalls.

## INNOVATION

Education is pivotal in integrating AI into medical training, and there are several benefits to comprehensive training of medical students in AI. First, medical curricula should include both the advantages and limitations of AI, especially concerning vulnerable populations. Second, medical students must be trained to recognize and mitigate biases and inequalities that AI may introduce when applied to minority and disadvantaged groups. Third, education and training must teach medical students to communicate effectively with communities that may distrust AI due to historical injustices[4], [6]. Fourth, reforming medical education to emphasize AI's promise and limitations, including its ethical, social, and psychological dimensions, is important to ensure social justice and equity when it comes to using AI in medical practice. Preparing physicians to understand these complexities ensures they can employ AI responsibly, minimizing health disparities and improving care for all populations.

## IMPACT

The short- and long-term impacts of training medical students to address AI's unintended consequences for vulnerable groups are significant. First, physicians will develop competencies to identify and address AI related biases, fostering equitable care for minority populations. Second, training allows the medical profession to proactively address the ethical and practical challenges of AI in healthcare. The long-term benefits include mitigating AI's impact on health equity, professionalism, and patient safety while reducing harm. This approach promotes AI innovation, encouraging research addressing medical education and healthcare challenges. Finally, the innovation should inspire medical schools and other health professional schools to adopt innovative models that integrate AI into healthcare, ensuring equitable outcomes for protected groups by addressing AI's limitations and biases. Training and education position the medical profession to uphold ethical standards, reduce harm, and improve health equity for vulnerable populations.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Fighting by promoting: transforming the medical education study process and assessments with AI*

*Lithuanian University of Health Sciences (Lithuania)*

AUTHORS

Martynas Burneikis, Medical Student; Kėja Dvilaitytė, Medical Student;

Gabija Grinaitė, Medical Student; Justas Kvietinskas, Medical Student

## PURPOSE

AI is rapidly developing. Modern students use AI to simplify concepts, write papers, and take exams. Generative AI applications save time in research, generate ideas, and enhance writing. (1) Bernard Chang, dean for Medical Education at Harvard Medical School, compared GenAI now to the internet in the 1990s, which soon after became indispensable. (2) However, while AI simulates knowledge, it cannot replicate practical skills. Therefore, we must adapt to AI and introduce rules for its ethical use as it is here to stay. To ensure high-quality studies, medical schools should focus on skills development and adjusting evaluations.

## INNOVATION

We propose a medical education system where students' skills are developed using one of three approaches: 1) AI use is prohibited, 2) AI use is allowed with certain restrictions, 3) AI use is encouraged. Tasks where AI use should be prohibited must be presented in a way that students cannot physically use AI, for example, by organizing oral exams. These could include theoretical assessments of essential medical knowledge, such as anatomy. Second-category tasks should ensure that using AI without critical thinking results in a low grade. These tasks could assess practical skills, where AI aids in preparation, but grading depends on students' own decision-making and actions. Ethics-related tasks also fall into this category since AI is not a moral agent. For tasks that do not fall into Categories 1 or 2, students must be encouraged to ethically use GenAI for time-consuming information processing tasks, to elaborate ideas, and data gathering, while declaring AI use. To prevent academic dishonesty, stricter requirements are necessary. We propose more practical exams or oral theoretical exams instead of written ones. Practical assessments should evaluate the application of theoretical knowledge under various conditions. Theoretical exams should favor open-ended questions. Evaluations should focus on reasoning, creativity, and originality. Assessments should be supervised to prevent AI use. For students with speech impairments, accommodation like extra time or written exams should be provided. For digital readiness, mandatory AI training is imperative. It would include an introductory AI course for first-year students (e.g., prompt engineering), elective courses, and compulsory training for educators to bridge the skills gap. In later years, topics on AI and other innovative tools would be integrated into subjects and modules to highlight their practical uses. For example, in the oncology module, teaching about how AI recognizes and classifies potentially cancerous skin lesions (3). Developing soft skills like critical thinking and source

evaluation must be a part of the study process. These solutions would enable students to recognize fallacies and biases, thus, use AI as a supplementary tool without viewing it as all-knowing.

## IMPACT

In the short term, implementation of these solutions might increase AI usage and decrease creativity and originality due to "blind trust" in AI and thus may result in lower grades. However, in the long term, our approach helps students learn to use AI wisely without relying blindly on it. This comprehensive AI usage strategy ensures the development of competent specialists with critical thinking skills.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Turmerik: Building the AI-Driven Framework for Global Clinical Trial Diversity*

*Perelman School of Medicine at the University of Pennsylvania (USA)*

AUTHORS

Amanda Moser, Medical Student; Ayushi Sinha, MBA Student

## PURPOSE

Diverse representation in clinical trials is essential to advancing equitable healthcare. Variations in genetics, socioeconomic factors, and environmental influences can significantly impact disease progression, drug efficacy, and treatment outcomes. Despite this, racial and ethnic minorities account for 39% of the U.S. population, but these groups comprise only 2% to 16% of participants in clinical trials.1,2 In 2020, among 32,000 participants in U.S. new drug trials, only 8% were Black, 6% Asian, 11% Hispanic, and 30% were aged 65 and older, reflecting a striking underrepresentation of key demographic groups.2 This lack of diversity leads to significant economic concerns, such as costly trial delays and inefficiencies, and undermines scientific validity by producing incomplete or non-generalizable research outcomes.2 Without broad demographic inclusion, clinical data risks being skewed, potentially leading to biased therapies that fail to address the needs of underrepresented populations. Further, managing clinical trials and sorting complex datasets can be cumbersome, creating inefficiencies that significantly slow down the pace of scientific advancement.

## INNOVATION

Turmerik is a healthcare Artificial Intelligence startup dedicated to revolutionizing the clinical trial process through innovative AI solutions. Our goal is to build the AI infrastructure for streamlined and diversified patient recruitment, protocol generation, and site selection for the 491,000 clinical trials run globally.3 We aim to maximize trial success by precisely matching eligible patients through advanced data-driven algorithms. Turmerik's AI system identifies patients who may be eligible for clinical trials through additional diagnostic tests, thereby expanding the recruitment pool. The platform provides transparent explanations for patient matches, ensuring clarity and understanding of the selection criteria used in the recruitment process. A unique aspect of our platform includes automated follow-ups and reminders to increase the likelihood of patient retention within clinical trials. Turmerik is also working to eliminate bias via creating greater flexibility in trial site selection based on geographic or regional clusters.

## IMPACT

Ensuring that clinical trials are representative enhances the scientific validity of findings and promotes trust in medical research among historically underserved groups. Addressing this gap is pivotal to delivering tailored, patient-centered care and achieving global health equity. Our current work is centered

on collaborating with healthcare leaders at global health institutes in India and Thailand to pioneer medical data storage and streamline clinical trial protocol generation. Turmerik's enhanced research capabilities take the burden off of hospital administrators and personnel to directly manage clinical trials, leading to greater bandwidth for grant and funding applications. Streamlined recruitment and trial management enable more studies to be completed successfully, leading to improved patient care. Turmerik previously worked with an Indian based healthcare institute to digitize paper-based records while optimizing a system that flags missing information for critical metrics such as diagnosis timeline, pathology reports, and treatment regiments. Our AI research tool for advanced data analytics accelerated clinical research by analyzing patient outcomes and creating tailored visual outputs to support decision making. As Turmerik continues to expand and partner with burgeoning biotechnology investigators, we aim to empower healthcare institutions to advance scientific innovation and deliver equitable, patient-centered care.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*From Theory to Practice: AI-Enabled Case Simulations for Health Professions Students*

*Medical College of Wisconsin (USA)*

AUTHOR
Amarpreet Mahil, Medical Student

## PURPOSE

Effective patient care requires interdisciplinary collaboration, yet health professions education frequently does not provide organized opportunities for students from multiple fields to collaborate. This concept uses artificial intelligence (AI) to support interactive, case-based learning experiences that mimic authentic healthcare environments, addressing the need to enhance interprofessional collaboration.

## INNOVATION

We propose the creation of an AI-powered Interdisciplinary Case Simulator designed to enhance teamwork and collaboration among health professions students.

Key Features of the Platform:
Drawing on insights from Arbelaez Ossa et al. (2022), the platform will emphasize using AI as a tool to explore clinical decision making, ethical challenges and interdisciplinary collaboration. Students will analyze clinical scenarios, explain their reasoning, and compare it with AI generated responses. They will also reflect on biases that can be present in both AI systems and human decision-making, engaging in discussion about the ethical implications of AI in healthcare.

Incorporating findings from Yin et al. (2021), the platform will integrate real-world clinical practice guidelines, such as screening, diagnosis, or risk analysis for certain conditions like sepsis, heart failure, and
pneumothorax. These models will allow students to efficiently identify gaps in their knowledge in a low-risk environment, enhancing their confidence in clinical settings.

The AI-powered simulator also tailors learning materials to each student's role in the case. For example, medical students can focus more on diagnosis and treatment plans, while physical therapy students can practice designing rehabilitation strategies. The platform will monitor communication patterns and provide real-time feedback on teamwork and decision-making dynamics, fostering a deeper understanding of each profession's contributions. The platform will track individual and team progress, offering actionable insights for students and educators.

Potential Limitations:
Bias in AI algorithms poses a significant risk of perpetuating disparities in healthcare delivery. Mitigating this requires training datasets that comprehensively represent diverse patient populations across age,

ethnicity, sex, and socioeconomic status. Furthermore, validating these algorithms with representative populations is essential to ensuring equitable healthcare outcomes.

Implementation:

A pilot program will be conducted at a university-affiliated academic health center. Key steps will include developing a set of interdisciplinary cases based on real-world AI applications (Yin et al, 2021), training faculty and students on the AI platform, conducting workshops so teams can work through cases and have debriefs to discuss lessons learned. Evaluation metrics will include reviewing the improvements in interprofessional collaboration skills (assessed through pre- and post-program surveys), surveys to assess student satisfaction with the learning experience and faculty feedback on the platform's utility into the curriculum.

## IMPACT

Short-term impacts include improved teamwork skills and a deeper understanding of the roles and contributions of different health professions. In the long term, this approach can produce healthcare professionals who are better prepared to work in interdisciplinary teams, improving patient outcomes. This approach also streamlines educational efficiency by integrating real-time access to medical literature, keeping students current on best practices, and optimizing feedback. By creating interactive and collaborative learning opportunities, this AI-driven approach has the potential to transform health professions education and collaboration.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*AI for Adaptive Emotional Intelligence Training in Nursing Education*

*Faculty of Nursing, University of Colombo (Sri Lanka)*

AUTHORS

Ama Gunasekara, Nursing Student; Navya Alwis, Nursing Student;

Thanusha Demel, Nursing Student; Lohitha Ruhunage, Nursing Student

## PURPOSE

Emotional intelligence (EI) is the ability to manage both your own emotions and understand the feelings of people around you (MHA, 2023). It is a critical component of nursing practice, as it directly impacts patient care, communication, and decision-making. Nurses frequently face emotionally charged situations, requiring them to regulate their own emotions while also responding empathetically to patients, families, and colleagues. However, traditional nursing education often lacks comprehensive and consistent training in emotional intelligence, leaving students underprepared for the complex emotional demands of the profession. This research investigates the application of artificial intelligence (AI) in developing adaptive emotional intelligence training systems for nursing education. The primary aim is to deliver personalized and contextually relevant training, empowering nursing students to effectively navigate complex emotional situations in clinical environments. Additionally, AI can evaluate students' emotions during immersive experiences, providing valuable insights into their emotional responses. This approach seeks to connect theoretical emotional intelligence learning with practical applications, thereby enhancing nursing practice and patient care.

## INNOVATION

This study introduces an innovative approach that employs AI technologies—such as natural language processing (NLP), machine learning, and virtual reality (VR) to create personalized emotional intelligence training programs for nursing students. Unlike traditional methods that adopt a one-size-fits-all strategy, this system offers dynamic, real-time simulations of emotionally challenging scenarios, including end-of-life care and high-stress emergencies. Recent advancements show that artificial intelligence can not only recognize but also predict emotions. AI significantly impacts social emotions such as empathy and compassion, as well as interpersonal phenomena like justice and cooperation, which are crucial for learning (Olider et at., 2024). AI algorithms analyze students' verbal and non-verbal cues, such as their tone of voice, body language, and facial expressions, allowing for an assessment of their emotional responses and communication strategies. This enables the provision of tailored, personalized feedback and suggestions to support individual improvement. The adaptive nature of this training accommodates varying learning paces, fostering continuous development in emotional intelligence. Furthermore, VR simulations provide immersive environments where students can practice empathy, conflict resolution, and emotional self-regulation in realistic, risk-free settings.

## IMPACT

Integrating AI-driven adaptive EI training into nursing education has the potential to create a meaningful impact. By offering personalized, real-time feedback, an AI system can enhance the learning experience, enabling nursing students to quickly master EI skills. This development fosters stronger emotional resilience, improves conflict management, and enhances patient relationships—all crucial for improving patient outcomes and healthcare delivery. Furthermore, the scalability of AI systems allows EI training to reach a broader range of nursing programs, including those in resource-limited settings. This increased accessibility ensures that more nurses can acquire the emotional skills necessary for delivering high-quality care, regardless of their environment. By nurturing these skills early in their careers, such systems can also help reduce burnout and improve job satisfaction, contributing to a more engaged workforce. Ultimately, AI-driven EI training stands to transform nursing education by providing tailored, effective learning opportunities. This innovative approach will cultivate a new generation of nurses who are not only technically proficient but also emotionally intelligent, thereby enhancing the overall quality of patient care and fostering healthier work environments.

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## AAHCI Student Leadership Initiative (ASLI): *Abstract*

# *MAESTRO: Mobilization Through AI-Driven Epidemiological Surveillance, Tracking, and Risk Optimization for One Health Leadership*

*University of the Philippines Manila (Philippines)*

AUTHORS

Jeremy Ace F. Ng, Medical Student; Emma Gabrielle Alessandra A. Panopio, Medical Student

## PURPOSE

Vector-borne diseases remain a significant public health predicament in the Philippines and globally, parallel to the growing population, climate change, and limited success in vector control measures. Compounded by emerging threats from antimicrobial resistance, food insecurity, and environmental degradation, system-level challenges including disjointed risk assessment and surveillance, lack of comprehensive risk communication and community involvement efforts, and poor disease surveillance in animals persist. These challenges underscore the imperative for future health professionals to be equipped, in skill and technology, to identify trends, generate insights, and command action using health trend analytics guided by the One Health Approach (Barroga et al., 2018; Dayapera et al., 2024). Traditionally, health trend analytics have been passive— its retrospective focus, especially on paper-based data, gathered through periodic reporting and manual interpretation greatly limits its real-time impact and use, especially in situations that demand quick responses. In light of this, there presents an opportunity for applying and appreciating the One Health Approach in analyzing real-time, multi-sectoral data and developing proactive strategies to address the growing threat of vector-borne disease for the purposes of both training simulation and real-world management.

## INNOVATION

MAESTRO is an AI-driven disease surveillance and monitoring system that primes AI to aggregate, integrate, and analyze multiple data inputs from credible sources such as geographic information systems (GIS), meteorological, epidemiologic, and laboratory data, enabling real-time insights for public health interventions. Its utility in health trend analytics is directed towards surveillance and monitoring, predictive modeling, and risk profiling. AI recognition of trend anomalies for detecting unusual patterns and case spikes necessary for early warnings of potential health threats will prepare both community healthcare providers and citizens to act proactively during health crises, ensuring timely interventions and resource allocation. Risk profiling is also streamlined since population algorithms determine areas that are at higher risk with the interplay of demographics, comorbidities, economic capacities, and social determinants of health while further taking into account the meteorological and geographical data of the corresponding populations. Lastly, AI-predictive capacities can utilize historical and current data to predict outcomes and trends of vector-borne diseases while simultaneously simulating feasible interventions and determining their impact on disease control. Beyond its utility, MAESTRO fosters interdisciplinary

collaboration and prepares trainees to interpret and integrate diverse datasets for a more comprehensive assessment, in order to ultimately design and implement more relevant interventions for the community.

## IMPACT

In a time when data is within reach, AI can be greatly efficient and beneficial in weaving together pieces of information to be analyzed together and utilized in fields of surveillance, disease prevention, health education, public health interventions, and policy making. Furthermore, the input from MAESTRO is beneficial for health professions education as it encourages the mobilization of the academe in continuously updating and remodeling curricula and/or educational objectives, such that the health education model produces healthcare workers equipped to respond to changing trends. Overall, MAESTRO utilizes AI as an integral component in cultivating people-empowering health systems where health systems and health education are rooted in proactivity rather than reactivity.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Revolutionizing Medical Education: AI-Powered Statistical Training for Medical Student Research*

*University of Missouri - Columbia School of Medicine (USA)*

AUTHORS

Yijin Huang, Medical Student

Martin Bundi, Advisor; Maricianah Onono, Advisor

## PURPOSE

Medical students face a critical challenge: balancing intense academic workloads with the need to produce high-quality research, which has become increasingly essential for residency applications [1]. The transition of USMLE Step 1 exam to pass/fail has elevated the importance of research productivity, particularly for competitive residency programs [2]. Proficiency in advanced data and statistical analysis is crucial for research [3]. With this skill, students can independently analyze large datasets and produce tables/figures suitable for publication. Although the ability to interpret biostatistics is taught at many medical schools, courses focused on writing code and using statistical packages like R or SPSS are often not offered [4]. Thus, this initiative aims to address the need for data analytics education among medical students by offering an AI-powered, self-paced training course to teach medical students how to perform statistical analysis for clinical research.

## INNOVATION

This statistical training program introduces a self-paced, AI-powered course designed to teach medical students essential statistical analysis skills through the use of public datasets. Students will use these datasets to learn how to perform descriptive, bivariate, and multivariate analysis, all of which are crucial components of a clinical research publication.

By leveraging artificial intelligence tools, such as the R Wizard function in ChatGPT, the course can enable students to independently learn how to conduct statistical tests, including t-tests, chi-square tests, and multivariable logistic regression. AI will assist students in troubleshooting coding errors, optimizing analysis workflows, and learning complex statistical concepts more efficiently. Students will be guided step-by-step through the process of preparing datasets, performing analyses, and interpreting findings. By automating code generation and resolving errors, AI dramatically shortens the learning curve associated with mastering statistical programming languages, enabling students to focus on the conceptual and analytical aspects of research [5]. This innovative approach addresses a key barrier to research productivity, time constraints, by streamlining the learning and analysis process.

## IMPACT

In the short term, this statistical training program will support students in utilizing advanced statistical methods in abstract and manuscript preparations, which in turn, significantly enhances their

competitiveness for residency applications. Students will develop practical expertise in data analysis and research design, positioning them to pursue impactful projects more independently and efficiently. In the long term, this statistical training initiative will cultivate a generation of physician-researchers proficient in advanced statistical methods, such as logistic regression and propensity score matching. These skills will support not only the integration of data-driven approaches in clinical research but also enhance knowledge of how biostatistics is performed among physicians in clinical practice.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*AI-Driven Curriculum Enhancement: Transforming Student Learning in the Health Professions*

*University of Oklahoma College of Medicine (USA)*

AUTHORS

Andrew Hojjat, Medical Student

Martin Bundi, Advisor; Maricianah Onono, Advisor

## PURPOSE

A significant challenge in the education of healthcare professionals is the integration of newly discovered knowledge into preexisting curricula. Each year, countless biomedical papers are published, and numerous technological advancements are made, resulting in a noticeable disconnect between what is taught in educational programs and the highest standards of patient care. Doctors, pharmacists, nurses, and other healthcare professionals are expected to operate in an increasingly complex patient care environment, where understandings of illnesses, drugs, and treatment protocols are continually evolving.

## INNOVATION

AI platforms can swiftly analyze and synthesize the vast biomedical literature in ways that are both comprehensible and actionable. OpenEvidence, an AI-driven medical information platform developed by Mayo Clinic and The New England Journal of Medicine, achieves this while ensuring credibility through citations. Professors and administrators could consult OpenEvidence and similar platforms to revise and update curricula. This approach would not only ensure accuracy through oversight but also allow programs to maintain their unique educational priorities. A key aspect of this strategy would involve intelligent prompting and questioning of AI platforms, allowing instructors to identify and address deficiencies in their existing materials. Furthermore, AI could play a direct role in aiding students' understanding and retention of cutting-edge knowledge. AI tools could address questions, adapt language, contextualize information, and help students recognize patterns. Furthermore, AI platforms can generate creative mnemonics, examples, stories, and visual aids.

For instance, an instructor could upload current lecture slides on type 2 diabetes management into an AI platform. The AI might identify that the latest evidence regarding the adverse effects of a specific GLP-1 agonist is missing. It could then generate a revised slide set, complete with an annotated diagram, full citations from recent studies, and even a brief rhyming poem to help students internalize the information. A struggling student could interact with the AI by asking questions, and the platform may respond with a personalized explanation linking the adverse effect to the drug's class-specific mechanism in streamlined terms. In the future, a classroom's collective conversations with AI could take place on a unified, interactive platform that also provides feedback to educators about areas of study students find challenging.

## IMPACT

AI-strengthened curricula would usher in a new era of healthcare education, equipping students with an acute awareness of novel developments in biomedicine. However, certain limitations and challenges must be considered. Numerous institutions, including schools, professional organizations, and standardized exam creators, would have to cooperate to establish new proficiency standards. Additionally, current AI platforms often lack the nuanced ability to evaluate or prioritize information as humans do. Errors remain prevalent, and AI tools may have limited access to proprietary research or privately held ideas. Ethical concerns, such as those surrounding trust, transparency, and the potential perpetuation of sociocultural biases in AI algorithms, also require careful consideration. Despite these hurdles, thoughtful regulation and collaboration could allow AI to empower students and future healthcare professionals to fully participate in the process of elevating patient care.

# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Bridging Cultures, Building Skills: A Virtual Patient Simulator for Culturally Competent Clinical Reasoning*

*Mohammed Bin Rashid University of Medicine and Health Sciences, Dubai Health (UAE)*

AUTHORS

Sameer Asim Khan, Medical Student; Humza Iqbal Rathore, Medical Student;

Fawaz Shefeek Mohammed, Medical Student; Jamal Taiyara, Medical Student

## PURPOSE

The Virtual Patient Simulator addresses a critical gap in medical education: the need for culturally adaptive, interactive, and dynamic tools that prepare students for real-world clinical practice. Clinical reasoning, a cornerstone of medical education, requires synthesizing knowledge, evaluating differential diagnoses, and making informed decisions [1]. However, traditional teaching methods, such as the use of standardized patients (SPs) and static case simulations, are resource intensive and may fail to provide diverse case exposure, particularly for preclinical students [2,3].

Virtual patient technologies offer a promising solution by enabling learners to practice clinical reasoning in a risk-free environment. Studies demonstrate their ability to enhance diagnostic accuracy, promote reflective thinking, and develop structured approaches to data gathering and hypothesis testing [4,5]. By leveraging large language models (LLMs), the simulator delivers dynamic, interactive simulations that expose students to varied clinical scenarios, helping them build complex mental representations of illnesses while mitigating cognitive biases.

This platform provides clinically oriented training for preclinical students, facilitating the transition to clerkships, particularly for those with limited access to SPs. Its culturally adaptive design ensures relevance across diverse healthcare contexts, addressing the significance of cultural differences in learning clinical reasoning [6].

## INNOVATION

Students are provided with cases once a week, where they chat with an LLM-based virtual patient through text on their own devices in real-time. They must run a consultation and identify differential diagnoses, required investigations, and possible management plans. The virtual patient responds with a plethora of manually-set information, including the presenting complaint, background information (demographics; lifestyle; past medical history and medications), and both systematic and system-specific symptoms – additionally, the virtual patient is set to behave according to a variety of traits, including personality, medical literacy and knowledge, beliefs and attitudes towards medicine, mood and responsiveness to the type of question, and language proficiency. Students are encouraged to work in groups to facilitate collaborative discussion and peer-based feedback. The high degree of customizability allows for exposure to a large range of possible situations, preparing them for an increasingly diverse patient population and accounting for potential region-specific scenarios and patient archetypes. Students also have the

opportunity to practice consultations in various languages. The virtual model allows pre-clinical students to pause and reflect on their progress at their own pace, reducing anxiety and fueling efficiency. Data-driven insights over the long term can serve as a benchmark for feedback and reflection.

## IMPACT

Short term goals begin at the institutional level by allowing faculty to monitor student progress and engagement, as well as providing a diverse pool of patients based on several demographics such as cultural and possibly religious backgrounds. Pre-clinical students can benefit from early exposure to a variety of patients and cases that represent real-world healthcare scenarios, enhancing preparedness from the classroom to the hospital.

Ultimately, the implementation of the Virtual Patient Simulator allows future doctors to communicate freely with patients of varying backgrounds from several cultural contexts. Doing this will remove some of the barriers that exist to improved care and enhance service to patients.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

## *AI Integration to Medical Research Learning in Syarif Hidayatullah State Islamic University Jakarta: Survey on Students' Readiness*

*Syarif Hidayatullah State Islamic University Jakarta (Indonesia)*

AUTHORS

Aisya T. P. Wigati, Medical Student; Aurick Yaafi, Medical Student;

Muhammad Rafi Arifiansyah, Medical Student; Beka Salima Dewi Maharani, Medical Student

## PURPOSE

Efforts to integrate Artificial Intelligence (AI) into medical curriculum have been made in some institutions around the world following World Medical Association's Recommendations. The trend for AI in learning medicine is mostly related to analyzing and reasoning on diagnostic and management for the patients, also for writing a research study. The use of AI would give perspective on the medical teachers and students to develop, implement and use safe, effective, and ethical AI in learning.

## INNOVATION

There are steps to deliver the project. First, need assessment to evaluate the readiness of students and teachers for using AI in the module. Next step is implementation of AI integration in the module, and lastly, evaluation will be conducted after the implementation of IRM module. The need assessment as the preliminary survey was done to the 2nd and 3rd medical students prior to AI integration in the module as a cross-sectional study. Medical Artificial Intelligence Readiness Scale (MAIRS) questionnaire was used, and data was gathered through Google online forms. Total score from MAIRS is calculated from each student using mean. After the survey has finished, the results will help with the plan for AI implementation and evaluation on the module.

## IMPACT

This innovation would suggest students to use AI wisely and maintain their competencies on critical thinking skills, professionalism and integrity. Integration of AI into medical curriculum in the long run would navigate medical students not only to use AI ethically and appropriately, but also to gain abilities to develop AI technologies for medical research purposes.

# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*AI-Driven Mirror Therapy Application for Limb Amputation Rehabilitation*

*Faculty of Nursing, University of Colombo (Sri Lanka)*

AUTHORS

Dulipa Thilakarathna, Operation Theater Nurse; Mangalika Samanmali Abeywickrama, Nursing Lecturer;

Iresha Lakmali Kuruppu, Nursing Lecturer; Dilsha Harshani Somadasa, Nursing Lecturer

## PURPOSE/INNOVATION

Artificial Intelligence (AI) is reshaping health professions education by introducing advanced tools that enhance both learning and clinical outcomes under worldwide ethical guidelines. Mirror therapy, traditionally used in limb amputation rehabilitation, has evolved with AI integration to provide more precise, engaging, and personalized treatment. These advancements highlight AI's significance in contemporary healthcare professionals, including nursing education, preparing students for innovative and patient-centered care.

The primary issue addressed by this innovation is the persistent challenge of managing phantom limb pain and promoting motor recovery in amputees. Traditional mirror therapy, while effective, lacks personalization and accessibility. AI-powered mirror therapy applications bridge this gap, offering tailored and interactive rehabilitation options that improve patient outcomes. By integrating these technologies into health care professionals are empowered to utilize cutting edge tools in their future practice.

Mirror therapy relies on the brain's ability to adapt and reorganize through neuroplasticity. Simulating the presence of the amputated limb reduces phantom limb pain and improves motor function. AI-powered applications enhance these outcomes by integrating virtual and augmented reality to generate real-time, adaptive visual feedback. These tools provide features such as gamified exercises, progress tracking, and customizable therapy plans, making rehabilitation both effective and engaging.

AI tools simulate clinical scenarios, offering healthcare professionals hands-on experience with advanced rehabilitation technologies. Virtual models allow learners to practice assessment and intervention techniques in a safe, controlled environment, fostering clinical competence.

Beyond mirror therapy, AI has broader applications in health professionals' education, such as personalized learning platforms, virtual patient simulations, and data-driven curriculum improvements. These tools promote critical thinking and evidence-based practice, essential for contemporary nursing roles.

The integration of AI in nursing education is transformative. Mirror therapy application specifically demonstrates how technology can bridge theoretical knowledge and clinical practice. Healthcare professionals gain exposure to innovative tools that prepare them to address complex rehabilitation needs confidently and effectively.

However, challenges such as data security, algorithm bias, and the need for technological literacy among both healthcare professionals and educators must be addressed. Collaborative efforts are essential to ensure equitable access and ethical AI use in education. Training programs should prioritize technological fluency alongside clinical skills, ensuring future nurses and other healthcare professionals are well-equipped for dynamic healthcare environments.

## IMPACT

AI-driven mirror therapy application exemplifies the potential of technology to enhance rehabilitation outcomes and all healthcare professional's education. By integrating these innovations into curricula, healthcare professionals are better prepared for the demands of modern healthcare. The continued evolution of AI in health professions education promises to redefine patient care and foster a generation of technologically adept and compassionate healthcare professionals.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*AI-Enhanced Diagnostic Kit for Early Detection and Personalised Management of Challenging Diseases*

*Universiti Malaya (Malaysia)*

AUTHORS
Sajad Jamal Pour; Fatemeh Abaei

## PURPOSE

Challenging diseases often evade early detection, leading to delayed treatment and suboptimal patient outcomes. Traditional diagnostic methods may not provide the sensitivity or personalization required for effective disease management. There is a critical need for innovative solutions that integrate cutting-edge technologies to address these gaps.

## INNOVATION

We propose the development of an AI-enhanced diagnostic kit designed to revolutionize the early detection and management of challenging diseases. This innovative platform leverages artificial intelligence to analyze biomarker data from non-invasive samples, such as saliva or blood, providing rapid and accurate diagnostic insights.

AI-Driven Analysis: The diagnostic kit utilizes advanced machine learning algorithms to identify patterns and anomalies in biomarker data, enhancing the precision and reliability of early disease detection. Personalized Management: By integrating patient-specific data, the platform offers personalized management plans, tailoring interventions to individual patient needs and improving treatment efficacy. User-Friendly Interface: The kit is designed to be easily integrated into clinical workflows, providing healthcare professionals with intuitive tools to interpret results and make informed decisions quickly.

## IMPACT

Short-term Impact: This innovation will reduce the time and resources required for accurate disease diagnosis, enabling healthcare providers to initiate timely and appropriate interventions. It will enhance the educational experience of health professionals by providing them with practical, AI-driven diagnostic tools. Long-term Impact: In the long term, the widespread adoption of this diagnostic kit in healthcare settings will lead to improved patient outcomes through earlier detection and tailored treatment strategies. It will also drive further research and innovation in biomarker-based diagnostics, advancing the field of personalized medicine.

# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Building Bridges to Better Hearts: A Proposal for Utilizing Artificial Intelligence (AI) in Heart Failure Bridge Clinics to Reduce Hospitalization and Readmission Rates*

*Cleveland Clinic Abu Dhabi (UAE)*

AUTHOR
Noora Alhajri, Internal Medicine Resident

## PURPOSE

Heart failure (HF) is a complex clinical syndrome that result from any structural or functional cardiac disease that alters the ventricle muscle ability contract or relax. It is characterized by high morbidity and mortality rate, increased demand for healthcare system and access to advanced therapies. Heart failure is becoming increasingly prevalent. It is estimated that more than 60 million people are diagnosed with heart failure globally, and in the Middle East alone about 3.75 million patients are diagnosed with heart failure (GBD 2017 Disease and Injury Incidence and Prevalence Collaborators, 2018). Data from this region has demonstrated that the average age of heart failure patients is 10 years younger than their Western counterparts with the mean age ranging between late 50s to early 60s (AlHabib et al., 2011; Manla et al.,2023). In the UAE, the lack of established heart failure digital clinics and scarcity of heart failure specialist nurses and healthcare providers represent one of the main challenges. Additionally, the lack of highly specialized remote hemodynamic monitoring that guide medication decision making represents another perspective to the coexisting challenges. Clinical trials have shown that the implementation of wireless, implantable, pulmonary artery pressure monitor device (Cardio-MEMs) has led to a 28% reduction in the Acute HF rehospitalization rate, and this reduction can still be seen after 2 years of PAP-guided management (Maddox et al., 2024).

## INNOVATION

How to optimize the heart failure care: building bridges to the heart?

1) Team based heart failure care
As novel medications and advanced remote cardiac monitoring devices become available, the need for optimal communication and care coordination between the patient and healthcare providers becomes vital. The need for team-based approach for the management of heart failure is evident in the published clinical trials. Data has shown increase patient awareness of early sign of heart failure, better adherence to guideline directed medical therapies (GDMT), and higher proportion of patients receiving optimal dose of GDMT. We recommend implementing an integrated approach consisting of effective team-based heart failure care clinic with implementing advanced remote cardiac hemodynamics monitoring devices that utilize artificial intelligence in deducting patient vitals such as blood pressure, heart rate or even body weight to assess the patient's volume status and the need to adjust the dose of HF medications such as diuretics or beta blockers. We also propose the utilization of wireless implantable biosensors such as Pulmonary artery pressure (PAP) monitors (CardioMEMS; Abbott, Abbott Park, IL, USA) to assess the

volume status and measure patient's critical vitals. The CardioMEMS send the data about the pulmonary artery filling pressure, which is a surrogate variable for the hemodynamic and volume status and can reflect either status of volume overload or volume depletion base on the PAP readings and this data is reviewed in the HF clinic by the MDT team and can guide further GDMT/ diuretics dose adjustments and determine the need for closer follow up in the clinic.

## IMPACT

1. Improves patient health outcomes
2. Reduce heart failure readmission rate and reduces morbidity and mortality.
3. Reduce health care expenditure associated with heart failure readmission
4. Reduce Economic Burden on Healthcare system, In the Middle East the total estimated costs of heart failure was $1.92 billion, and the estimated annual per patient costs was the highest in the UAE, with the inpatient admission cost accounts for 56% of the cost drive . Hence improving Heart failure remote monitoring and care, improves the clinical outcomes and reduces the need for in-hospital re-admission.

# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Education on Assistive AI*

*University of California, Davis, School of Medicine (USA)*

AUTHOR
Ivy Pham, Medical Student

## PURPOSE

Health centers are rapidly adding AI to enhance patient care, efficiency, and reduce costs. [1] However, while AI promises to transform diagnosis, treatment, and patient management, many doctors feel unprepared to use AI tools. [2] Furthermore, more is desired when it comes to involving clinicians in the development process of AI. [3] This proposal directly addresses these urgent needs by outlining a novel curriculum designed not just to equip clinicians with the skills to use AI in a way that still enhances patient care, but to empower them to understand it deeply and guide its development.

## INNOVATION

To bridge this critical gap, we propose "Clinicians and AI" a three-part program to help clinicians practically understand AI, be engaged in the development process of AI, and finally share what they learn in a scalable manner.

Part 1: Understanding AI: We begin covering properties of supervised statistical machine learning and large language models. These concepts are applied to real-world clinical scenarios through case studies, where we explore tradeoffs in using AI for diagnosis, risk assessment, patient monitoring, analyzing medical text, and more. We will discuss AI bias, and examine where and when biases arise in different AI models. Through dissecting a series of concrete examples, we develop a clinician's "AI intuition" – an understanding of the limitations and strengths of AI, discernment of where more caution should be placed, and the ability to recognize potential biases. We also discuss concerns like alarm fatigue, fragmented AI system integration, and lack of software uniformity across medical devices.

Part 2: Clinician-Led Innovation through partnerships with tech: We will facilitate partnerships between clinicians and technical experts, including PhD students and AI companies to incubate short-term projects that integrate AI solutions. We prioritize solutions that are designed to fit in existing clinician workflows and minimize patient risk, while directly addressing pressing challenges.

Part 3: Defining practical and ethical principles for medical AI: Drawing on their newly acquired knowledge and practical experiences, teams of participating clinicians and students will collaborate to define a set of core principles and practical insights to guide future development and deployment of AI. For example, teams might focus on AI for risk factor identification; developing principles addressing ethical implications, necessary human intervention points, and accountability standards.

## IMPACT

In the short term, the pilot curriculum will empower participating clinicians and students with a deeper, more practical understanding of AI, fostering critical thinking and ethical awareness. In the long term, the partnership component will spark collaborative AI projects grounded in real clinical needs, and bring technologists and clinicians closer together. By fostering collaboration and establishing principled foundations, we strive to contribute to safer, more equitable, and ultimately, better patient care, while also offering a valuable model for academic health centers seeking to embrace AI education and inspire further innovation in this critical field.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Removing racism: The role of AI in detaching discrimination from medical education*

*Faculty of Medicine, University of Colombo (Pakistan)*

AUTHOR

Lukman Hassan Hallaj Shafi Vedaralalage, Medical Student

## PURPOSE

Racism in healthcare is not a new phenomenon. With undertones of discrimination radiating to medical education and assessments.[1][2] Apotheosis on MCAT scores hampered the entry of underprivilege groups into medicine despite the MCAT being a poor predictor of future success in medical exams or licensing.[3][4] In the UK, black physicians had lower pass rates in specialty examinations and a greater likelihood of training extensions likened to White, Asian or interracial physicians from similar economic backgrounds.[5] Medical systems continue to, by intrinsic under addressed factors, undermine the integration of minorities into health infrastructure, causing individual and systemic deficiencies in cultural competency. Despite this, studies suggest that homogeneity in healthcare propagates physician bias and diverse education and care teams improve health outcomes for patients and financial outcomes for health personnel.[6][7] BIPOC integration must be a priority to achieve universal equitable health. This abstract will focus on equity in medical school assessments.

## INNOVATION

Considering racial equity, artificial intelligence could accelerate preexisting mechanisms while facilitating novel routes for examination fairness. Consider the Sri Lankan Advanced Level examination. A combination of Z-scores, national ranking lists and district quotas reward academic excellence while addressing regional differences in resource availability.[8] AI integration would allow the weighing of additional factors in the final score, including individual economic status, resource availability as well as personal circumstances. This is made possible with AI's capacity to carry out Z-score filtering, dataset normalization and manage advanced computational complexity. The DebateTracker application of the Sri Lanka Debaters' Council employed an analogous prototype to this. Horizontal technological integration is viable. AI could also streamline more score-independent examinations. In entrance interviews and more personalized examinations, AI's ability to objectively evaluate multiple large independent datasets would allow fair assessment in instances where human biases may be more likely to interfere. Such systems are being tested.[9] Even where physician examiners may be preferred, machine learning could be leveraged to analyze individual biases and scoring habits by examiners to ensure candidates receive equitable grades. University entrance and residency matching focused machine learning models have been tested with the goal of reducing these biases.[10][11][12] Retrospective analyses of written or verbal evaluations via Natural Language Processing systems have also been carried out.[13][14] Direct video evaluations may further elevate AI in this role. Implementation of the above would require appropriate supervised, unsupervised, and deep learning with avoidance of algorithmic, learning linked, source-based,

or supervisor-introduced biases.[15][16] AI's capacity to exponentially and iteratively evolve promises to accelerate this process.

## IMPACT

AI integration into the toolset of medical education proves beneficial for educators and students alike, as it would promote diversity and equity while bolstering the credibility of testers and regulatory bodies. It also provides the opportunity for greater analysis of examination to drive positive change. However, the outcome is dependent on the prudent and strategic usage of AI. System builders risk infecting AI systems with the same biases of status quo. Wise system building and management is desiderated to avoid this.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*An Interactive Gamified Platform with Artificial Intelligence for Orthopedic Education: A Proposal for Innovation*

*Faculty of Medicine, University of São Paulo (Brazil)*

AUTHOR
Vitor Matheus Silva, Medical Student

## PURPOSE

Orthopedic education requires new methods to overcome persistent challenges in engaging students and bridging theoretical learning with clinical application.(1-2) Traditional approaches, such as lectures and written exams, are often insufficient to foster critical thinking, clinical reasoning, and procedural skills essential for orthopedic practice.(1-2) Additionally, assessment methods can be subjective, varying according to instructors' perspectives, and may not adequately reflect students' true competencies.(1-2) These gaps highlight the need for a dynamic and adaptive tool that integrates learning and evaluation while aligning with modern educational standards and evidence-based practice.(2)

## INNOVATION

We propose the development of a gamified educational platform powered by artificial intelligence (AI) to transform the learning and assessment process in orthopedics. The envisioned platform would incorporate real-life cases, including patient images, diagnostic exams, and clinical scenarios, creating an interactive and immersive environment. Gamification elements, such as points, rankings, and scenario-based challenges, would aim to enhance student engagement and motivation.
The platform would feature an AI-based evaluation system designed to provide impartial and standardized feedback. Instructors could define assessment criteria, such as diagnostic accuracy, clinical decision making, and procedural skills, which the AI would use to analyze student performance. To ensure reliability and clinical relevance, the AI would be trained using reference materials from established orthopedic guidelines and the most up-to-date evidence. Additionally, the platform would offer personalized feedback to students, identifying areas for improvement and suggesting resources to address knowledge gaps. This idea also envisions the dual utility of the platform as both a learning aid and an assessment tool, adaptable to different levels of training and institutional objectives. By focusing on customizable case scenarios and evaluation parameters, the platform could cater to diverse educational settings, from undergraduate programs to specialized orthopedic training.

## IMPACT

If implemented, this proposal could significantly enhance orthopedic education in the short term by increasing student engagement and providing a more interactive approach to learning. Students would benefit from practicing clinical reasoning and procedural skills in a simulated yet realistic environment. The AI-based evaluation system would reduce biases in assessments and provide consistent feedback,

supporting fairer and more objective competency evaluations. In the long term, the platform has the potential to contribute to the standardization of orthopedic education across institutions. By integrating updates in clinical evidence, it would remain aligned with evolving guidelines, ensuring that students are trained with the most relevant knowledge and practices. Furthermore, such a platform could foster collaboration between institutions, sharing cases and experiences to improve the collective quality of orthopedic education. This proposal represents a step toward integrating advanced technology into medical education, exploring how gamification and AI could address longstanding challenges while opening new opportunities for innovation in teaching and assessment.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Custom Conversational Agents for Clinical Reasoning Education*

*University of California, Davis, School of Medicine (USA)*

AUTHORS

Tuyet Thao Nguyen, Medical Student; Katherine Guo, Medical Student

## PURPOSE

As artificial intelligence (AI) becomes increasingly integrated into healthcare, it presents new opportunities for the improvement of clinical training. Traditional methods of practicing clinical skills and reasoning with standardized patients (SP) are resource-intensive with regards to training, materials, case design, and compensating SP time [1]. Furthermore, student interaction with SPs is typically limited to in-person organized structured clinical encounters. Out of 106 medical schools, a median of 59 hours was spent teaching the physical exam, of which 38% of the time involved using standardized patients [2]. There remains a gap in educational tools that students can use independently to improve clinical reasoning skills and simultaneously self-study for an Objective Structured Clinical Examination (OSCE). Currently, ChatGPT, the chatbot developed by OpenAI, can simulate SP responses given a case prompt [3]. The Geisel School of Medicine utilizes GPT-4o in their "AI Patient Actor" to present a variety of cases and grade students [4]. Our project expands on these innovations while addressing this need for scalable, cost-effective, and flexible training tools to enhance clinical reasoning in students.

## INNOVATION

We developed custom AI-powered conversational agents using large language models (LLMs) trained on Step 1 clinical knowledge sources. These agents simulate standardized patients, allowing students to engage in realistic clinical scenarios through chat or voice-based interactions. The LLMs are able to present typical lab findings, physical exam findings, and feedback based on the learner's performance, providing a comprehensive learning experience. Unique to our innovation, students themselves can generate specific cases that target their desired learning goal and easily customize and change different elements of the case without instructor input. This method also emphasizes student development of robust illness scripts from the AI generated cases essential for clinical reasoning development. Each AI standardized patient can be shared among students, enabling collaborative or team-based case discussions. This feature fosters peer teaching and teamwork while enhancing flexibility in clinical training.

## IMPACT

In the short term, this innovation offers an engaging, accessible, scalable, and cost-efficient solution for clinical reasoning training. Students can practice diagnostic and decision-making skills anytime, anywhere, with detailed feedback to guide their growth. Long-term impacts include improving patient safety by enhancing diagnostic accuracy, fostering communication and teamwork skills, and preparing students for AI-integrated healthcare environments. Academic health centers can utilize this model to develop AI-

driven case simulations customized to their patient population and learning objectives. While these language models are not without their limitations, this innovation can foster discussions about both classic and unique case presentations. Finally, in this rapidly evolving intersection of healthcare and AI, it may serve as a reminder to students not to rely solely on AI for clinical decision-making, but rather to use it as a tool to enhance their own reasoning and judgment.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Developing an Interprofessional Reflection App*

*Faculty of Nursing, University of Colombo (Sri Lanka)*

AUTHORS

Samindi Upeka Malalagama, Undergraduate; Imesha Chathumini, Undergraduate;

Sasindu Pravishka Fernando, Undergraduate

## PURPOSE

Interprofessional education (IPE) is a critical approach for preparing students to enter the health workforce, where teamwork and collaboration are important competencies (Diggele et al., 2020). IPE promotes interprofessional cooperation between the medical and the nursing profession. Skills in interprofessional communication and roles understanding will be primary preconditions to improve collaborative patient-centered care. (Homeyer et al., 2018). The use of Artificial Intelligence (AI) technology in the field of healthcare education and teaching is likely to be integral in any contemporary healthcare curriculum design. Selected examples in healthcare and education include AI for clinical data systems, educational genomics mapping, healthcare social media, and ChatGPT (Connolly et al., 2023). Effective IPE requires healthcare students to understand the complexities of real-world multidisciplinary collaboration. However, limited access to firsthand professional experiences poses a challenge to achieving this goal. To bridge this gap, we propose developing an app that enables healthcare professionals to share their reflections on working in multidisciplinary teams during special situations, such as handling critical care emergencies or managing complex chronic conditions. This app aims to foster experiential learning by providing interprofessional students access to curated summaries of these reflections and enabling direct interaction with the professionals.

## INNOVATION

The proposed app introduces a novel approach to experiential learning in IPE by leveraging artificial intelligence (AI) and reflective practices. Key features include:

1. Reflection Input Interface
A user-friendly, questionnaire-based interface is used for healthcare professionals to document their experiences and insights from special situations.
2. AI-Powered Summarization
Advanced AI algorithms analyze and summarize these reflections into concise, structured narratives accessible to students.
3. Interactive Learning
Students can ask follow-up questions, enabling dynamic interaction with professionals to gain deeper insights.
4. Thematic Categorization
Reflections are organized into themes such as patient safety, team communication, or ethical dilemmas, aligning with IPE learning objectives.

5. Inclusive Access
Designed for mobile and web platforms, the app ensures accessibility across various educational settings

## IMPACT

AI is transforming nursing education by enhancing both teaching methodologies and student experiences. The integration of AI-driven technologies fosters critical thinking, collaboration, and adaptability, essential for addressing complex patient care needs. By simulating real-world scenarios, AI bridges the gap between classroom learning and clinical practice, preparing nursing students to excel in interdisciplinary healthcare settings. However, challenges remain. Ethical considerations, such as data privacy and algorithmic bias, must be addressed to ensure equitable access to AI tools (Al Kuwaiti et al., 2023). Additionally, the integration of AI requires technological literacy among educators and students, necessitating ongoing training and support (Buchanan et al., 2021). Addressing these challenges will maximize the potential of AI in Nursing education.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Enhancing Medical Education with AI in Histopathology Image Interpretation*

*The Aga Khan University (Kenya)*

AUTHORS

Brian Weru Komu, Medical Student; Sarah W. Wambugu, Medical Student;

Ciano W. Ng'ang'a, Medical Student; Peter O. Micha, Medical Student

## PURPOSE

Histopathology is vital for diagnosing and understanding diseases, but learning to interpret these images can be challenging for medical students. Traditional methods like using static slides, attending lectures, and limited access to diverse pathology samples often fall short. These hurdles can lead to mistakes in diagnosis and inconsistent clinical practice. Additionally, the scarcity of experienced pathologists for immediate feedback makes mastering this skill even tougher. To bridge these gaps, we need a new, tech-driven approach that makes histopathology education more accessible and engaging for students in all disease contexts, such as cancer and microbial infections.

## INNOVATION

Our platform includes a vast collection of digital slides, showcasing various diseases and conditions. Powered by advanced deep learning, the system uses convolutional neural networks (CNNs) to point out critical features like abnormal cell growth, tissue death, and signs of tumor spread. By guiding students through identifying these features, the tool enhances their ability to recognize patterns crucial for making accurate diagnoses. The AI not only guides but also evaluates. It checks student input against a database of expert-annotated slides, offering instant feedback on what was right, what went wrong, and how to improve. This real-time feedback minimizes the need for constant human supervision while maintaining high educational standards. It also gives the student pointers on how to identify specific slides from other similar ones, while giving the ones that are in close relation with the slide. To keep students motivated, we have added a gamified experience. They can tackle diagnostic challenges, earn badges for proficiency, and participate in case simulations generated by AI. The system adapts to each student's skill level, ensuring that challenges are manageable but stimulating, encouraging deeper learning and retention.

## IMPACT

This AI tool boosts student interest, sharpens their diagnostic skills, and structures their learning. They gain access to a wider range of cases, get immediate feedback, and enjoy a personalized learning journey. The platform also aims to cultivate skilled medical professionals capable of accurate histopathological diagnoses. By weaving AI into medical training, institutions can modernize traditional education, making it more effective and scalable. The platform's analytics will also help educators spot common student issues, guide curriculum improvements and targeted teaching. While platforms like Paige AI use deep learning to help pathologists diagnose cancer, our system is designed specifically for all conditions. It is not about

replacing human pathologists but about enhancing traditional learning. Students gain a solid foundation in recognizing histopathological patterns before stepping into clinical practice. Through this blend of AI and education, we aim to elevate the quality of medical training, reduce diagnostic errors, and improve patient care.

# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Bringing Medicine to Life: The Role of Virtual and Augmented Reality in Medical Education*

*The Aga Khan University (Kenya)*

AUTHORS

Ivy W. Mwaura, Medical Student; Rebecca M. Mutie, Medical Student; Ummikulsum F. Parpia, Medical Student

## PURPOSE

Medical education faces the dilemma of balancing student access to clinical exposure without compromising the safety of the patients. Traditional modes of learning such as textbooks and lectures in many ways fail to prepare students for an actual medical scenario, let alone interprofessional teamwork during patient care. With less-experienced learners accidentally compromising quality care, ensuring the safety of the patients while the students are trained is crucial. In addition, access to cadavers and modern technologies is limited and poses some limitations to effective learning. Moreover, ethical considerations hinder the learning process as well. This demands innovative, immersive, and interactive learning tools to enhance medical education and student competency.

## INNOVATION

To overcome the above challenges, medical education institutions are actively integrating simulation-based learning and virtual reality (VR) technology into their programs. Through incorporation of first-hand experience alongside research on ongoing implementations across different institutions, we discovered that high-fidelity simulation and VR technology significantly enhance clinical skills through hands-on training. At the Center for Innovation in Medical Education (CIME) at Aga Khan University Kenya, high-fidelity simulation labs allow students to practice surgical procedures, emergency care, and patient management in a risk-free environment. CIME incorporates high-fidelity mannequins, augmented reality (AR), and AI-driven simulations to enhance medical training. Additionally, VR provides 3D simulations of human anatomy and medical procedures which is well illustrated by the North-West University in South Africa which implements VR-based anatomy and procedural training sessions, as a cost-effective alternative to traditional cadaver dissection.

## IMPACT

In the short term, the incorporation of AI into medical education is enhancing student engagement and comprehension through interactive learning experiences. The use of simulation also provides a safe environment for students to practice complex medical procedures, improve skill acquisition, clinical reasoning, and decision-making capabilities. Notably, this approach is also reducing the reliance on live patients for training, hence addressing related ethical concerns. In the long term, the implementation of AI in medical education seeks to produce more competent and confident healthcare professionals. The overall improvement of patient safety is guaranteed as students gain experience before real-life interactions.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Creation and Evaluation Frameworks for AI-Guided Clinical Simulation*

*University of California, Davis, School of Medicine (USA)*

AUTHOR
Ivy Pham, Medical Student

## PURPOSE

Clinical simulations are essential for the education of health professionals, and new AI techniques are unlocking more realistic patient interaction methods, like talking to fake patients in real time via audio, or talking to fake patients in a fully simulated clinical environment. [1, 2] Yet, there lacks nuanced benchmarks for these simulations--there's a need for robust frameworks to guide creation and evaluation of AI-powered simulations. Current LLM-guided virtual patient interactions often lack structured pedagogical approaches making quality assurance a challenge. Recent papers in this field often evaluate based on a question answer metric, evaluating on datasets like MedQA or Medical Vignettes. [2, 3] This proposal addresses these gaps by outlining a novel creation and evaluation framework for AI-guided clinical simulation to ensure quality, adherence to core medical competencies, and pedagogical standards.

## INNOVATION

This initiative proposes a program to develop creation and evaluation frameworks for clinical simulations that goes beyond a series of questions and answers. Framework for AI Simulation Development: A committee will be focused on developing a systematic methodology for creating effective AI-powered simulation, to be done in collaboration with existing third party providers. This includes defining stages for learning objectives, creating a set of realistic patient scenarios, outline expected diversities in responses including in content/tone/emotion, and standards for red-teaming adversarial conversations. Systematic Evaluation Methodology: In collaboration with AI researchers and AI clinical simulation companies, define a set of metrics that can properly evaluate the above framework. This may end up being a set of question answers, and beyond that, vignettes that are categorized in a specific manner. For example, there may be a category of question answers for how well the simulations cover a certain topic, have a sufficient diversity in how a patient might respond, or how realistic responses are. Additionally, we may define additional statistical based methods or large language model (LLM) autocritics. For example, we may ask an LLM, "how realistic was this patient response?" or "does this set of sample patient responses cover X demographics?" or "does this set of patient responses cover X pedagogical criteria?"

## IMPACT

The implementation of the proposed framework will improve the development of AI-powered clinical simulations within medical education. By establishing a robust methodology for assessing the quality and effectiveness of these tools, this initiative will foster innovation and enhance the pedagogical soundness of

AI-driven simulations. Medical and health professions students will benefit from improved clinical training through systematically designed, rigorously evaluated simulations that align with core competencies.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Harnessing AI to Assess Donor Liver Steatosis: Transforming Transplantation and Patient Outcomes*

*Lithuanian University of Health Sciences (Lithuania)*

AUTHORS

Eglė Juškevičiūtė, Medical Student; Ignas Lapeikis, Medical Student

## PURPOSE

Liver transplantation remains a vital intervention for end-stage liver disease [1-2]. Nevertheless, an increasing number of donor livers are being discarded, often due to steatosis [3-4]. The gold standard for assessing hepatic steatosis is histopathology of a biopsied liver, which is both invasive and time-consuming [5]. Research shows that donor livers are often inaccurately deemed more steatotic and could have been transplanted without increased mortality risk [3]. With increasing demand for liver transplantation surpassing donor supply, waiting list mortality has become a significant issue [3]. The subjectivity in steatosis evaluation further exacerbates the problem, especially in peripheral hospitals where pathologists are unavailable during night shifts to confirm liver status via biopsy. In such cases, physicians rely on medical history, laboratory results, color, and texture to assess the liver - highly subjective factors [5-6]. Furthermore, sending biopsies to central hospitals risks compromising organ viability [7]. Artificial intelligence has the potential to label and quantify histopathologic features objectively on digitized donor liver allograft slides, facilitating transplant decision making [3]. Thus, a rapid and accurate method based on AI to access graft steatosis is crucial for reducing post-surgery liver dysfunction risks and improving patient outcomes.

## INNOVATION

We propose an artificial intelligence (AI)-driven platform utilizing advanced machine learning algorithms to assess donor liver steatosis. Narayan et al. demonstrated that computer vision AI could evaluate steatosis levels of liver allograft biopsy slides [3]. Similarly, Moccia et al. explored machine learning to analyze liver texture via RGB imaging during surgery, highlighting the potential for AI in steatosis determination [5]. Given the challenges posed by night shifts, resource limitations in peripheral hospitals, and time constraints, we propose developing a model capable of analyzing donor liver texture for steatosis risk assessment. The model would require taking a smartphone image of the donor liver, dividing the image into patches, and analyzing RGB values using specialized software trained to assess steatosis levels. Features such as local binary pattern histograms, intensity-based metrics, and donor blood characteristics would be integrated, leveraging insights from previous successful models [5-6].

## IMPACT

Harnessing AI to assess donor liver steatosis level has the potential to improve transplantation medicine. In the short-term, this innovation addresses organ wastage, ensuring that livers, previously at risk of

being discarded, are accurately identified and used for transplantation. This would improve organ utilization, accelerate decision-making process, and reduce waiting-list times. Patients would benefit from fewer complications due to inaccurately diagnosed liver changes, there by ensuring safer post-transplant outcomes [2]. In the long-term, such models could enhance organ quality assessment and equity in allocation. This innovation could improve survival rates and reduce healthcare costs associated with post-transplant complications for both patients and hospitals [2]. Moreover, successful implementation of AI in the transplantation could foster broader acceptance of AI-driven systems in medicine, paving the way for its application in other organ transplants [8]. This innovation could inspire further development of AI driven solutions, addressing critical issues in patient care and safety while promoting clinical excellence, professionalism, and efficiency.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Enhancing Anesthesia Education and Patient Safety Through Artificial Intelligence Integration*

*Faculty of Medicine, University of São Paulo (Brazil)*

AUTHOR

David De Araujo, Medical Student

## PURPOSE

Anesthesia is a cornerstone of modern medicine, requiring precision and rapid decision-making under pressure. However, traditional training methods often fail to adequately prepare trainees for the complexities of real-world perioperative care. The absence of personalized learning tools and immersive simulations limits the ability of current methods to replicate high-stakes scenarios. This gap poses significant risks to patient safety and highlights the need for innovative approaches to anesthesia education. The integration of artificial intelligence (AI) offers transformative potential, allowing educators to address these challenges by tailoring training to individual needs and enhancing clinical preparedness. Studies have demonstrated that AI-based tools can improve clinical decision-making and prediction accuracy, underscoring their relevance in medical training (Hashimoto et al., 2018; Komorowski et al., 2018).

## INNOVATION

This project introduces an AI-powered platform designed specifically for anesthesia training, combining state-of-the-art technologies to revolutionize educational approaches.

- Adaptive Learning Algorithms: These algorithms personalize content delivery, ensuring that training addresses individual gaps and enhances knowledge retention (Lee et al., 2018).
- Virtual Reality (VR) Simulations: The platform provides immersive scenarios replicating complex perioperative challenges, enabling trainees to practice high-risk procedures in a safe, controlled environment.
- Predictive Analytics: By employing machine learning models, the platform trains users to anticipate complications through real-time analysis of patient data patterns.
- AI-Driven Feedback: Trainees receive instant, actionable insights into their performance, fostering continuous improvement and better decision-making.

The innovation extends beyond technology to include interprofessional education (IPE) principles, enabling trainees to collaborate with virtual teams representing anesthesiologists, nurses, and surgeons. This approach promotes team-based learning, enhances communication skills, and simulates real-world clinical dynamics.

## IMPACT

The integration of AI into anesthesia education has the potential to reshape the field, offering significant benefits in both the short and long term. Immediate outcomes include an anticipated 30% improvement in decision-making accuracy and a 25% reduction in response times among trainees. These advancements

are expected to enhance confidence and competency in managing complex perioperative scenarios, directly contributing to improved patient outcomes. Long term, this initiative aims to establish a new standard for anesthesia training globally, equipping future anesthesiologists with the skills to leverage AI tools effectively. By fostering a culture of technological proficiency and interprofessional collaboration, this project will not only reduce perioperative complications but also pave the way for safer and more efficient healthcare practices worldwide. By merging cutting-edge AI technologies with established educational frameworks, this initiative exemplifies the transformative potential of innovation in medical education. It aligns with global trends in integrating technology into healthcare, offering scalable solutions adaptable to diverse clinical and educational settings.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

## *Exploring Filipino Medical Students' Attitudes and Perceptions of Artificial Intelligence in Medical Education: A Mixed-Methods Study*

*College of Medicine, University of the Philippines Manila (Philippines)*

AUTHOR

Robbi Miguel G. Falcon, MD-PhD (Molecular Medicine) Student

## PURPOSE

Filipino medical students are expected to be able to address pressing problems in the Philippine healthcare system and demonstrate the learning outcomes set by the Commission on Higher Education Memorandum Order No. 18 Series of 2016 (Dioquino-Dimacali, 2017; CHED, 2016). In this memorandum order, medical informatics, but not artificial intelligence, is identified as required curriculum content. Medical students must also be able to maintain and contribute to the existing institutions for health by creating new knowledge and technology (Baticulon et al. 2021, Sana et al., 2022; Sana et al., 2015). The recent developments in large language models and the advent of ChatGPT has resulted in heightened interest to include artificial intelligence in the medical curriculum.

## INNOVATION

If the current trajectory of developments in artificial intelligence and healthcare continues, this current generation of medical students will be using AI tools in their clinical practice. Thus, this study aims to elucidate the medical students' attitudes and perceptions on the inclusion of AI in medical education, its impact on physician roles and the physician patient relationship, as well as the ethical considerations of using AI tools, including chatbots, in medical practice.

## IMPACT

In conclusion, our findings show that medical students have developed a baseline understanding and awareness of AI but require more opportunities to formally train and learn about responsible use of these tools, in both the medical education and, eventually, clinical practice landscape. Such courses must be designed to sufficiently equip students with the fundamental knowledge needed to overcome ethical concerns related to AI use and utilize these tools in practical applications to improve patient care and healthcare provision, altogether.

# AAHCI Student Leadership Initiative (ASLI): *Abstract*

## *"Think-Tank" Education Model: A Collaborative Research-Focused Approach to Artificial Intelligence Education*

*Hackensack Meridian School of Medicine (USA)*

AUTHOR
Danielle Kong, Medical Student

## PURPOSE

Artificial intelligence (AI) is a burgeoning field of technology that has revolutionized many industries, including healthcare, with many different algorithms already being implemented in hospitals across the US. AI has the potential to significantly improve healthcare outcomes, which is why it is crucial for current and future healthcare providers to be well-versed in this technology. AI education in medical training serves to equip future physicians to gain a deeper understanding of potential AI-based tools that will be implemented in their medical careers. In addition, educating medical students about AI prepares them to navigate challenges such as algorithmic bias, data bias, privacy, and informed consent. We propose an AI "think-tank" with the goals of (1) educating future physicians about the use of AI in healthcare, (2) creating a deep understanding of AI for future healthcare leaders, and (3) creating opportunities for research in AI. By incorporating foundational education about AI into medical training, we empower future clinicians to take a proactive role in better utilization of this technology in healthcare.

## INNOVATION

The model proposed to educate medical students about AI is a "thinktank" that has been implemented by one faculty member at Hackensack Meridian School of Medicine and has grown to 30 students. First, incoming students are led through a foundational education series on core AI ethics topics, including journal club-like discussions pertaining to trust and bias, data privacy, training validation, generative AI, AI in mental health, and governance and legal considerations of AI. Once the group's foundational knowledge is set, students can explore their particular research interests within AI ethics: students take turns presenting journal articles and leading discussions. Further, guest speakers are invited to lecture on their areas of expertise. These events take place during biweekly group meetings. In addition to these activities, students create their own research projects to further their learning. While these projects are carried out independently in small teams, students are able to brainstorm with and gain feedback from the entire "think-tank."

## IMPACT

The goals of this educational "think-tank" model are to educate future physicians about the use of AI in healthcare, create deep expertise in AI necessary for future healthcare leaders, and create opportunities for AI research. It is important that learners are involved in planning their learning and identifying the resources to achieve their educational objectives, and mentors encourage active learning rather than

passively transmitting information. On an individual level, this interactive format of learning empowers learners to retain information better and understand how to seek out information more effectively. On a broader scale, this education model is fairly accessible and easy to replicate. Expensive resources and tools are not needed for this model to be implemented by medical schools or Continuing Medical Education, so education in AI can reach many learners. This "think-tank" model of education empowers future clinicians to be well-informed about AI technology, enabling them to use it effectively and take a proactive role in its implementation.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Personalized AI for Lifestyle Change: Improving Patient Outcomes Through a Medical Record-Based AI Tool*

*Jacobs School of Medicine and Biomedical Sciences at the University at Buffalo (USA)*

AUTHOR
Anna Szombathy, Medical Student

## PURPOSE

With ever-growing time constraints on patient visits, physicians often lack the time to provide extensive guidance to patients about diet and lifestyle modifications. Additionally, patients may face barriers to access nutritionists and lifestyle coaches who might answer their day-to-day questions about diet and exercise to optimize their health. The availability of technology, however, might begin to address these challenges. For patients with diabetes, for example, utilization of digital coaching for lifestyle change has already been studied and has demonstrated that such interventions can promote better adherence to dietary recommendations and improved glycemic control (1). However, with the advent of artificial intelligence (AI), such tools might be broadened to include all of a patient's comorbidities in formulating a lifestyle plan, and could become a safer alternative to an internet search where patients might encounter medical misinformation. Such a tool might also serve to combat food and/or nutrition insecurity by including information about local resources based on patient zip code.

## INNOVATION

Ideally this personalized AI lifestyle tool would be implemented through patient portals, where it might access information about each patient's current diagnoses, medications, other health risk factors, mobility status, and diet recommendations given by their physicians across different specialties. Patients would be able to access this AI at any time to ask questions about specific meals and activities that they plan to take part in. A patient with a recent stroke, for example, would be able to ask about what foods they should avoid to lower their cholesterol. Meanwhile a patient on warfarin might receive information that takes into consideration Vitamin K content that might undermine the efficacy of their medication. Patients might also work with the AI to formulate goals for continued improvement. The AI would also have up to date contact information for local resources based on the patient's zip code, so that it might connect them with resources based on patient needs. For example, it might house information about getting gym memberships covered by insurance, free exercise classes in the community, or food pantries near that specific patient.

## IMPACT

In the short term, this program might aid patients in implementing and adhering to lifestyle modifications that are tailored to their specific health circumstances. It would also provide resources to combat food and

nutrition insecurity and thereby begin to address some social determinants of health which may otherwise impede optimal health outcomes. In the long term, by promoting healthy lifestyle changes this program might improve patient life expectancies, especially for patients with multiple comorbidities (2). Healthier lifestyle has also been shown to slow cognitive decline, even in those with high genetic risk (3). In the long term, the numerous health benefits of lifestyle change might also decrease healthcare expenditures on chronic disease, which is currently a major proportion of spending in the US (4). Thus, this personalized AI lifestyle tool might serve to improve patient adherence to medical recommendations, improve long-term quality of life and improve overall health outcomes.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Developing AI Competence for Health Professions Students*

*University of Nebraska Medical Center (USA)*

AUTHORS

Nancy E. Krusen, Program Director and Professor; Jensen Antilla, Student

## PURPOSE

Curricular requirements for education of health professionals do not currently address competence in the use of artificial intelligence (AI). There is a need to develop educational policy, didactic content, learning activities, and disseminate information to a variety of knowledge users.

## INNOVATION

Our academic medical center created a 65-member AI task force in 2023. They reviewed challenges, developed guidelines, and created a strategic plan including goals. The innovative project will plan assessment in accordance with Kirkpatrick-level educational outcomes. The project will develop sample AI assignments with assessment of student competencies (Level 2b, modification of knowledge and skills; Level 3, behavioral change), and a template for integrating AI learning activities into curricula (Level 4a, change in organizational practice). The innovation project will support the AI Task Force strategic plan through dissemination with a variety of knowledge users.

## IMPACT

The innovative project will support UNMC in the forefront of AI, contributing to its mission of innovation and excellency. The project team proposes short term goals to 1) develop a logic model in support of the Task Force timeline to map tasks, participants, timeline, and resources, 2) develop example learning objectives and curricular materials for comprehensive application across disciplines, and 3) dissemination to a variety of knowledge users. The long-term impact will enable programs to uphold accreditation content standards, contribute to institutional policies and procedures, outline ethical application of AI, support professional development, and create community outreach.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Enhancing Patient Outcomes in Neurosurgery: Machine Learning for Predictive and Preventive Care*

*Medical College of Wisconsin (USA)*

AUTHORS

Philisha Mesidor, Medical Student; Akorfa Adobor, Medical Student

## PURPOSE

The purpose of this project is to reduce the substantial risk of postoperative complications in neurosurgery. These include infections, bleeding, and fluid buildup. To achieve this, we aim to develop a machine learning model capable of predicting these complications in real-time. Post-operative complications can significantly impact recovery, leading to extended hospital stays, repeated surgeries, and adverse health outcomes. A trained artificial intelligence model can leverage patient data to assist healthcare providers in identifying high risk individuals early, thereby improving surgical outcomes and patient safety.

## INNOVATION & IMPACT

By harnessing advanced machine learning, neurosurgery is taking a transformative leap. The artificial intelligence model will analyze diverse data sources, including electronic health records (EHRs), surgical data, imaging scans, and post-operative monitoring. The model will focus on the trends of aggregated data, ensuring that individual data points are deidentified and in accordance with HIPAA. However, with the combined dataset, the model can generate predictions on which patients are at higher risk for complications, such as infections or hemorrhage. The model can further delineate data based on factors like age, medical history, surgical specifics, and even real-time intraoperative data to ensure that there is thorough analysis while demographic-specific risk assessments.

The finalized artificial intelligence model will possess the capability to act on its predictions, enabling proactive interventions based on identified risks. For example, the system could alert healthcare teams if a patient's risk factors suggest an elevated likelihood of a complication, enabling them to take preventive actions before issues arise. This will translate to higher efficiency, lower costs, and may positively affect the metrics surrounding post-operative care. Studies in other areas of healthcare have shown that AI models can lead to significant improvements in patient outcomes, with applications reducing having overall mean concordance (C)-statistic around 0.7 in multiple fields such as neurology, cardiology, and intensive care admissions. The C-statistic is the commonly used statistic which measures discrimination, therefore representing a model’s accuracy. Over the long term, the model could be adapted and scaled for use in hospitals of all sizes, including smaller or resource-limited institutions. Cloud-based solutions enable hospitals to access the AI system without costly infrastructure and encourage physicians to collaborate, building a more comprehensive database. This project has the potential to revolutionize medicine, setting a new frontier for predictive care.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Complex approach for military servicemen dental care provision based on AI-driven diagnostics technologies: perspective for practice and education*

*Lithuanian University of Health Sciences (Lithuania)*

AUTHOR
Yaroslava Zaverukha, PhD Student and Lecturer

## PURPOSE

Dental care systems that are functioning within war conditions and aimed at providing dental treatment to the military servicemen represent highly specific complex of units and activities, which is significantly different from such within civilian environment.1,2 Nowadays several NATO standards, such as STANAG 2453 STANAG 2466, are used to ensure proper performance of dental care systems within military conditions.1,2,3 It should be highlighted that even though relevant AI driven diagnostic technologies changing the concept of modern dentistry, there is still a gap in experience, and even in attempts to spread and effectively use such within condition of ongoing war or armed conflict for the military servicemen. 5,6,7,8,9 Also, readiness to provide dental care for the military personnel within war-related conditions and education or training to provide such in proper manner both are lacking in factual understating and estimation. Primary objective of present project is to develop system of AI-enhanced diagnostic approaches that potentially may optimize process of complex dental care and timely diagnostics among military serviceman within conditions of ongoing war or armed conflict, and further collected data may be used to improve education of dental specialist for this specific matter.

## INNOVATION

Principal idea of present project grounded on the use of several digital dental technologies as a complex for rapid dental diagnostics provided for the military serviceman within the condition of mobile dental units, including: 1) intraoral scanning with convolutional neural network 3D image analysis for the teeth and mucosa pathological changes analysis;8,10,11 2) periapical X-ray image analysis with the automated deep learning classification regarding potential lesions present;12,13 3) periodontal charting enhanced by natural language processing algorithms for the express periodontal screening and monitoring.13,14 Later data obtained during such diagnostics may be used for the formulation of specific curriculum such as "Dental care in war conditions", which will improve readiness of dental specialists for the challenges of dental treatment need among military population. Collection of such diagnostic data in significant volumes among military servicemen may further be used to assess trends of oral health among army personnel, and also may exploit for the forensic purposes, enhancing process of comparative and reconstructive dental identification.

## IMPACT

The integration of AI into dental care for military servicemen offers substantial benefits, addressing immediate and long-term challenges in conflict zones. AI enhances diagnostic accuracy, enabling the detection of caries, prevention of its complications, and identification of traumarelated injuries, ensuring timely intervention and reducing risks. Resource optimization tools maximize efficiency by utilizing minimal technical and human resources, effectively addressing critical shortages in challenging conditions. AI-assisted platforms enable real-time collaboration between dental and medical teams, providing expert consultations and coordinated care in remote or resource-limited environments. AI-driven treatment planning delivers personalized approaches tailored to patient needs, even under constraints of limited decision-making time and rapid intervention requirements. Predictive analytics optimize rehabilitation outcomes when comprehensive diagnostics and treatment relocation are not feasible. Mobile dental units equipped with AI extend care to frontline areas, ensuring high-quality diagnostics and treatment. AI-powered training simulations prepare dental professionals for high-stress scenarios, enhancing their ability to manage complex cases. Importantly, AI improves the safety of dental professionals by enabling remote diagnostics, reducing prolonged interactions in high-risk zones. These innovations transform wartime dental care, fostering interdisciplinary collaboration, improving safety protocols, and providing comprehensive support for military servicemen.

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## AAHCI Student Leadership Initiative (ASLI): *Abstract*

# *Enhancing Diagnostic Accuracy: A Comparative Study of ChatGPT-4o and Traditional Medical Knowledge in Generating Differential Diagnoses Among Philippine General Hospital (PGH) Surgeons*

*College of Medicine, University of the Philippines Manila (Philippines)*

AUTHORS

Jan Francois B. Severo, Student; Katrina Francesca Yap Asedillo, Medical Student;

Julio Rafael M. Nakpil, Medical Student

## PURPOSE

Accurate diagnosis is critical, as diagnostic errors contribute to 10% of deaths and 6%-17% of adverse hospital events globally (WHO, 2019). Atypical presentations, in particular, are prone to errors, with discrepancies reported in up to 25% of cases (Friberg et al., 2019). Notably, ChatGPT has shown over 90% accuracy in diagnosing common diseases with typical presentations, showing promise as a supplementary diagnostic tool (Fukuzawa et al., 2024). While AI tools like ChatGPT-4o show promise in typical cases, their ability to handle atypical presentations remains uncertain. This study will assess how ChatGPT-4o performs in real-world diagnostic scenarios, focusing on its impact on accuracy and decision-making among physicians. Notably, no studies about the intervention of AI in diagnosing typical and atypical cases have been conducted yet in the Philippines. If validated, AI can be integrated into learning models and policies, benefiting medical students and improving patient outcomes.

## INNOVATION

This randomized controlled trial evaluates ChatGPT-4o's efficiency as a diagnostic aid for physicians. To align cases with their expertise for accurate diagnosis, participants are selected from the Department of Surgery at the Philippine General Hospital (PGH), the largest department in the country's largest government tertiary referral center. Participants are divided into two groups: one using ChatGPT-4o and the other relying solely on their clinical knowledge. The former group undergoes a brief training on using ChatGPT-4o. Each physician reviews clinical vignettes from expert-reviewed cases of patient medical records, featuring both typical and atypical presentations distributed equally. Vignettes are designed to test diagnostic skills under realistic conditions, focusing on patient history, vital signs, imaging and physical examination results, and diagnostic reasoning. Key outcomes include diagnostic accuracy determined by PGH consultants, concordance rates with expert diagnoses, and patterns of omission and commission errors in terms of the steps taken to achieve a diagnosis. This study also examines physicians' reliance on ChatGPT-4o, particularly in cases with atypical presentations, through qualitative analyses of the transcripts of their conversations with the AI tool. This may provide a nuanced understanding of its impact on clinical decision-making.

## IMPACT

This study can enhance the efficiency of case analysis, especially in PGH, where high patient volume and diverse presentations may challenge even seasoned clinicians. This is critical in the Philippines, where physician shortages remain severe—far below the 1.1 per 1,000 population standard (David et al., 2019). By assessing AI-assisted differential diagnosis, it offers physicians and medical students alike a credible and structured learning tool to refine reasoning while reducing cognitive overload and stress. Over time, this study could pave the way for AI-assisted diagnostic tools in medical curricula, providing a scalable, user-friendly, and cost effective approach to clinical training. AI could also help in telemedicine initiatives, bridging specialist gaps in rural areas by providing quick diagnosis and triage. Additionally, with proper use, integration, and development, it may reduce diagnostic errors, especially in atypical cases, leading to improved patient outcomes nationwide. This research could aid future AI integration policies, ensuring it enhances clinical reasoning and helps produce technologically adept yet responsible medical students and practitioners.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

## *AI-based cardiovascular surgery training system integrating virtual reality (VR) and augmented reality (AR) among medical students*

*Faculty of Nursing, University of Colombo (Sri Lanka)*

AUTHORS

T.A.M.H. Samanmalee, Student Nurse; K.N. Thalgaspitiya, Nursing Student;

G.S. Sewwandi, Nursing Student; S.B.H. Sudeshika, Nursing Student

## PURPOSE

Cardiovascular surgery training faces significant challenges in equipping students for complex procedures. Traditional classroom methods and textbooks often fail to capture the nuances of real-life surgical scenarios. While advanced AI-driven platforms exist, they are frequently inaccessible and primarily offer observational experiences rather than hands-on practice. This creates a critical gap in skill development, leaving students underprepared for intricate surgeries. The need for immersive, practical, and personalized training is especially urgent in resource-limited settings like Sri Lanka, where access to cutting-edge surgical education is restricted. By integrating AI with virtual reality (VR) and augmented reality (AR), a new training platform can provide realistic simulations and hands-on experience, bridging the gap between theory and practice. This innovative approach democratizes surgical education, ensuring students gain the essential skills and confidence needed for cardiovascular procedures, ultimately improving healthcare outcomes in underserved regions.

## INNOVATION

This proposal outlines an AI-driven cardiovascular surgery training platform integrating virtual reality (VR) and augmented reality (AR) to provide immersive, interactive simulations for medical students. By harnessing deep learning, 3D imaging, and computer vision, the system replicates complex procedures like coronary artery bypass grafting (CABG), valve replacements, and congenital heart defect repairs with high fidelity. AI-powered simulations introduce rare complications such as aneurysm rupture or arrhythmia, allowing students to experience and manage critical, high-pressure scenarios that are infrequent in traditional training. The platform features AI-driven labs where students practice autonomously, receiving real-time, personalized feedback on key metrics like incision accuracy, blood flow control, and procedural efficiency. Adaptive learning modules dynamically adjust the difficulty based on individual progress, fostering skill acquisition and boosting confidence through tailored challenges. This risk-free, hands-on training accelerates learning curves, enhances decision-making under pressure, and democratizes access to advanced surgical training. By bridging the gap between theoretical knowledge and practical experience, the system revolutionizes surgical education, preparing students for real-life operations and ultimately improving patient outcomes. This technology driven approach ensures that future cardiovascular surgeons are better equipped, more confident, and ready to handle complex cases with precision and competence.

## IMPACT

In short term this innovation significantly enhance medical trainees' ability to perform complex cardiovascular procedures by providing an immersive, risk-free learning environment. AI-powered feedback systems will ensure trainees can refine their skills with precision and build confidence before transitioning to live surgical settings. Long-term, this innovation will transform cardiovascular surgery education both globally and in Sri Lanka by producing a new generation of highly skilled cardiac surgeons. These surgeons will be better equipped to handle high-pressure scenarios, address complex patient needs, and reduce surgical errors, ultimately improving patient outcomes. By democratizing access to advanced training tools, this project also aims to close the gap in surgical education between resource-limited and resource-rich settings, fostering global equity in healthcare training and delivery.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Enhancing Medical Education through Integrating ChatGPT into Virtual and Augmented Reality Platforms for Real-Time Assistance*

*The Aga Khan University (Kenya)*

AUTHOR
Debra K. Kioli, Medical Student

## PURPOSE

Medical education is becoming more and more open to using advanced technologies as improvements toward better learning outcomes. Active AR/VR platforms are revolutionizing immersive learning experiences, especially within the domain of surgical training. However, the field is a relatively unexploited dimension of real-time, intelligent assistance integrated into the simulated environment. This requires an innovative and well-thought course of action in the best interest of the learners in the ever evolving field of medicine and medical education.

## INNOVATION

Generative Artificial Intelligence could provide an innovative approach toward on-demand guidance for the contextual knowledge the students need without removing them from the simulation environment. This can be done by using the usual simulation equipment, including AR-enabled smart glasses for overlaying information in real-world settings, haptic feedback gloves for realistic touch simulation and generative artificial intelligence software such as ChatGPT integrated into simulation software. Artificial intelligence is trained and constantly updated with reviewed medical and surgical information. Features that could revolutionize simulation include natural language processing where the artificial intelligence is able to understand voice and text queries hence provide real time guidance. Additionally, an exciting feature is ability to contextual guidance based on current happenings and optionally give 3D visual overlays due to its generative ability. Scenario based learning is made possible as artificial intelligence is able to give answers based on their specific actions, predict potential complications, and suggest alternative techniques based on best practices.

## IMPACT

Short term impacts are increased engagement as well as efficiency. Medical students and professionals can access real-time AI-powered guidance. This new outlook is simply additional and optional for those who would like quick responses and additional information during a simulation experience. More people can feel more comfortable and less intimidated in enhancing their medical knowledge using this tool and all in-all, a fun and insightful time will be achieved. Long term impacts will be desired higher knowledge retention and improved practice of procedures. This ultimately works towards building confidence by providing a responsive learning environment that also allows a user to explore multiple approaches to surgical challenges.

# AAHCI Student Leadership Initiative (ASLI): *Abstract*

## *Leveraging Artificially Intelligent Chatbots for Improving Empathetic Communication Skills in Medical Students*

*Hackensack Meridian School of Medicine (USA)*

AUTHOR
Anthony Peterson, Medical Student

## PURPOSE

Since their advent, artificial intelligence chatbots (AICs) have quickly begun to be utilized to enhance learning in medical education. However, their use has largely been limited to content learning. While an extensive knowledge of medicine is essential to becoming a skilled physician, being a doctor is about more than just knowing facts. Another element of medicine is engaging with and delivering difficult news to patients who are at a challenging point in their lives and are often experiencing strong emotions. Approaching these encounters with empathy can make all the difference between having a trust-filled physician-patient partnership and having a badly perceived, negative experience with the healthcare system. Additionally, positive patient encounters may increase physician wellness compared to negative ones. Fortunately, studies have found that empathy can not only be learned, but even short-term training can have a large impact on an individual's empathy. Despite this, establishing effective and meaningful courses on empathy—especially within the confines of the already overpacked medical curriculum—is difficult and resource-intensive, and opportunities to practice empathetic communication with real-time feedback are few and far between.

## INNOVATION

In direct contrast to developing a course focused on empathy, AICs are a free, accessible, and essentially pre-made training resource that could readily be used by medical students, residents, and doctors in practicing empathetic communication. As Haut et al. (2019) found, the foundation of empathy training is learning social cognition, a knowledge base already trained into AICs. Furthermore, as Ngo et al. (2022) found, two of the best ways to learn empathy are repetition and observation, both of which AICs are capable of assisting with. As such, we crafted prompts that can be inputted into any AIC (such as ChatGPT) to allow for practicing empathetic communication with a virtual patient while simultaneously getting real-time feedback. These prompts into AICs take the general form of, "With you taking the role as both patient and educator, and me in the role of doctor, can you take me through a medical role-playing scenario to help me develop my empathy?" These prompts can be framed in any specific desired scenario (such as delivering a cancer diagnosis).

## IMPACT

A few studies have looked at using virtual reality (VR) patients for a similar purpose, but VR technologies are not widely available. This use of AICs in empathy learning benefits from being both accessible and requiring relatively few resources. In a small-scale test, when engaging with these

practice scenarios, AICs are able to break down responses by what empathetic traits are being demonstrated (such as

acknowledgment and gratitude, normalizing feelings, and even pacing of the conversation) and suggest places for improvement, thus readily building a social-cognitive and objective understanding of empathy. More research is needed to quantify how well AICs understand the empathy required across a wide variety of social situations and how practice with these AICs can actually increase empathy levels, but should they live up to their potential, they could revolutionize how empathy is taught and developed in medical education.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*AI-Powered Ethical Dilemma Simulation for Medical Education: Enhancing Decision-Making in Real-Time*

*Mohammed Bin Rashid University of Medicine and Health Sciences,*

*Dubai Health (UAE)*

AUTHOR

Mohammed Amaan Khokar, Medical Student

## PURPOSE

Medical ethics education traditionally relies on static case studies and scripted OSCE scenarios, which fail to capture the complexity and unpredictability of real-world ethical dilemmas. [1][2][3] Healthcare professionals often face morally ambiguous situations where guidelines may not provide clear-cut answers. There is an urgent need for an innovative, dynamic, and interactive approach to ethics training that prepares medical students and professionals for real-world ethical challenges. This project proposes an AI-powered ethical dilemma simulation, leveraging machine learning and natural language processing to create adaptive, real-time interactions that assess and refine ethical decision-making skills. [4][5][6]

## INNOVATION

This initiative introduces an AI-driven chatbot system that engages users in interactive, scenario-based ethical dilemmas, where each decision alters the course of the case in real-time. Unlike traditional methods, this AI model: Simulates dynamic patient interactions: The AI plays the role of patients, families, and colleagues who challenge decisions, ensuring unpredictability and realism. Adapts scenarios based on user responses: Each choice influences subsequent interactions, offering a tailored ethical learning experience. Analyzes decision-making patterns: The system detects recurring ethical struggles, providing personalized feedback and targeted training. Incorporates emotionally intelligent AI: Utilizing sentiment analysis and contextual understanding, the AI can realistically portray human emotions and ethical conflicts. Integrates into existing curricula: This system can complement OSCEs, medical ethics courses, and interprofessional education programs.

## IMPACT

In the short term, this AI-powered ethics training tool will provide students with an immersive and interactive learning experience, enhancing their ethical reasoning and decision-making skills. It will enable educators to assess ethical competencies in a novel, scalable manner. Medical students will develop greater confidence in handling ethical dilemmas, fostering professionalism and moral resilience. In the long term, widespread implementation of AI-driven ethical simulations could standardize ethics education across institutions, ensuring consistency and effectiveness in training. The data-driven approach will also allow for continuous improvement in ethical education by identifying common areas of difficulty and tailoring future training modules accordingly. Furthermore, integrating AI into medical ethics education

could influence global standards for ethics training, contributing to a more ethically competent and prepared healthcare workforce. This initiative represents a transformative step in medical education, bridging the gap between theoretical ethics training and real-world application through AI-driven, interactive learning.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Bolstering AI Models by Improving Dysarthria Databases*

*University of Utah Health System (USA)*

AUTHOR
Russell B. deJesus, PhD Student

## PURPOSE

Our initiative addresses the gaps in artificial intelligence (AI) models when managing dysarthria. Dysarthria is a speech disorder that is specific to a neurological condition (Duffy, 2019). For example, dysarthria secondary to Parkinson's disease is characterized by rushed speech sometimes accompanied by vocal tremor, while a dysarthria secondary to a cerebellar stroke is characterized by inconsistent prosody, similar to speech under the influence of alcohol. Current machine learning algorithms fail to discriminate between these dysarthria subtypes, leading to a loss of precision in speech recognition models for users with dysarthria (Hassan Taj et al., 2016; Vaezipour et al., 2020). This is because these models have been trained on small, outdated, and unspecific dysarthria databases (Alhinti et al., 2021; Deller Jr et al., 1993; Kim et al., 2008; Menendez-Pidal et al., 1996; Middag, Catherine, 2012; Nicolao et al., 2016; Rudzicz et al., 2012; Turrisi et al., 2021; Yilmaz et al., 2016). The Nemours database uses only male talkers and the EasyCall corpus uses only Italian sentences. Each of these have a sample size of no more than 40 total participants, and they treat dysarthria as one condition rather than the 6 known subtypes (Duffy, 2019). This is because these databases are targeted toward training smart home devices. We propose the development of a clinically focused machine learning model based on a robust corpus that differentiates the dysarthria subtypes.

## INNOVATION

Currently, the Clinical Voice Studies Lab at the University of Utah (principal investigator: Dr. Brett Myers) is recording samples of hypokinetic speech secondary to Parkinson's disease. The participants (n = 50, age: >50 years) are Utah locals with Parkinson's disease who use American English recruited from the university's Speech-Language-Hearing Clinic. Each participant produces samples by reading aloud 5 Harvard/IEEE sentences (Zhang, 2015) to record a database of dysarthria specific to Parkinson's disease. Next, an equivalent number of participants (n = 50) will be recruited for each subtype: hyperkinetic, flaccid, spastic, and ataxic dysarthria. Their samples will be digitally labeled to allow supervised machine learning models to identify each subtype as was done in the previous databases. Further work will then determine how to train newer models on mixed dysarthria, which may require even larger samples. Collaboration with other institutions will enlarge the sample size and capture regional variations, thus serving underrepresented populations.

## IMPACT

AI is underutilized in modern speech therapy. Models trained on a more robust corpus can be used for much more than improving smart home devices. In the short term, a corpus that differentiates dysarthria subtypes will improve diagnostic accuracy for speech pathologists and neurologists. Additionally, robust corpora will enable generative AI to train the ears of both clinicians and caregivers, encouraging professionalism and quality patient care. Finally, this corpus will finetune our dysarthria models by providing more nuanced acoustic variations that are missing from outdated dysarthria corpora. Thus, in the long term, clinicians and academics will integrate AI into their practice to improve the quality of life for patients with neurological impairments.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

## *AI-Powered Learning Material Optimization for Medical Education*

*VinUniversity (Vietnam)*

AUTHOR
Linh Bao Luu, Medical Student

## PURPOSE

High-quality learning materials are essential for effective knowledge acquisition, retention, and application, particularly in medical education, where self-directed learning plays a pivotal role. However, many textbooks, clinical guidelines, and lecture slides do not optimally follow instructional design principles, which are critical for engaging learners and ensuring successful learning outcomes. As a result, these dense and unstructured resources increase cognitive load, making it difficult for students to extract, process, and apply key information efficiently. Applying instructional design principles—such as segmentation (breaking content into meaningful units), signaling (highlighting key concepts), and spatial organization (visual representations)—to learning materials can significantly enhance comprehension and retention. While educators have attempted to improve written materials through visualization, color coding, and annotation, there is no standardized framework or extensive research to guide these efforts. This lack of consistency forces students and educators to develop their own methods for organizing complex material, leading to inefficiencies in learning and application. Additionally, manually optimizing such materials is a time-intensive task that requires technical skills, creativity, and significant effort. Therefore, an AI-powered system capable of restructuring medical learning materials based on instructional design principles can offer a scalable and standardized approach to improving content organization and accessibility. Our goal is to develop an AI model that transforms any given medical learning material into an optimized, learner-friendly document while maintaining its educational integrity.

## INNOVATION

This proposal introduces an AI-powered model leveraging natural language processing (NLP) to transform medical learning materials into structured, learner-friendly formats that adhere to instructional design principles. Unlike conventional AI models, this system will analyze and optimize documents from an educational perspective, incorporating features such as cognitive-level classification (Bloom's taxonomy), emphasis on knowledge connections, support for comprehension and memorization, and active self-orientation during learning.

Key Features:

Content segmentation and hierarchical organization to break down complex information into structured, digestible units based on cognitive levels.
Color-coded text to differentiate, emphasize, and encourage deeper analysis of information.
Tables, flowcharts, and concept maps to visually organize relationships between concepts.

Guided question prompts to foster active engagement rather than passive consumption.
Creative mnemonics to enhance memorization and recall.
To ensure its educational value, the AI will not only automate content optimization but also require students to provide strategic input, fostering an interactive co-creation process. Additionally, the model will be trained using medical documents and evidence-based educational strategies to ensure accuracy, reliability, and competency in processing specialized materials.

## IMPACT

This AI-driven approach bridges the gap between traditional learning materials and modern educational strategies by transforming complex medical texts into visually structured, pedagogically optimized formats. Expected benefits include: Improved comprehension, retention, and clinical decision-making through structured learning materials. Increased efficiency in self-directed learning by reducing the cognitive burden of manual material organization. Enhanced critical thinking and engagement, as students actively contribute to content optimization rather than passively consuming information. Scalability across institutions, ensuring consistency and efficiency in medical education. By integrating AI into medical education in a structured and research driven manner, this initiative will provide a standardized, accessible, and effective approach to optimizing learning materials, ultimately contributing to more effective and evidence-based medical training.

# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Comparing Virtual Simulation and Traditional Hands-On Simulation in Medical Education*

*The Aga Khan University (Kenya)*

AUTHOR
Teresa W. Ndung'u, Student

## PURPOSE

Background
Historically, clinical skills and knowledge has been handed down to medical students via practical pedagogy. With the rise of virtual simulation technology, however, a whole new world of exciting possibilities for medical students opens up. Virtual simulation (VS) applies computer software that generates life-like scenarios, for example, a manikin avatar who suddenly goes into cardiac arrest, whereas hands-on simulation uses manikins for performing procedures like Cardiopulmonary Resuscitation (CPR). The objective of this study is to evaluate the effectiveness of virtual simulation and traditional hands-on simulation in medical education.

## INNOVATION

Methodology: To determine which method is easier, more flexible, more controlled, and preferred, a survey will be conducted among medical students at Aga Khan University, Nairobi. To analyze anonymized responses, we will distribute surveys and obtain informed consent. In order to collect quantitative and qualitative data, the surveys will contain both closed ended and open ended questions. We will measure the effectiveness of each method based on several factors: accessibility, flexibility, control over learning environment, perceived realism, resource efficiency, and overall preference. This comprehensive analysis will enable a deeper understanding of participant experiences and preferences.

## IMPACT

Expected Results: We aim to discover whether virtual simulation is perceived as more accessible and flexible, particularly among medical students at different levels of their education. Preliminary data will explore the possibility that while hands-on simulation is preferred for practical skills, virtual simulation may offer advantages in terms of repeatability and reduced resource needs. The study seeks to provide further insights into the relative strengths and weaknesses of each method in terms of teaching effectiveness.

Conclusion:

To conclude, this study will enhance the understanding on the effectiveness of virtual simulation and hands-on simulation in medical education. By evaluating the effectiveness of both methods, we aim to provide concrete recommendations for the optimal use of virtual simulation, ultimately improve the training and preparedness of medical students.

# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*AI Linked Noninvasive Blood Analyzer For Health Professional Education*

*Faculty of Nursing, University of Colombo (Sri Lanka)*

AUTHORS

P.W.G. Ashini Jayathilaka, Nursing Student; A. Sanduni Kaushalya Perera, Nursing Student;

K.B. Yehan Pasindu Dharmasena, Nursing Student; K.G. Dasun Darshana, Nursing Student

## PURPOSE

Artificial intelligence (AI) is an "intelligent setup" that mimics human intelligence consisting of algorithm for transforming traditional practices. AI in health care can be divided into virtual & physical branches. In physical branch, Robots, medical equipment, and tangible items used in health care are prominent. Adopting AI can significantly improve clinical practice including AI powered decision-making which can offer insightful analysis & evidence-based recommendations. Practice of blood analysis plays a vital part in clinical practice which can be integrated with AI. Traditional methods, often relying on theoretical instructions and invasive procedures can be impractical in certain settings. Invasive blood analyzers make challenges in real-time feedback, enabling repeated and discomfort measurements. Using and training AI related noninvasive blood analyzers mitigate those challenges in clinical education and practice.

## INNOVATION

Noninvasive blood analyzers provide real-time feedback, enabling repeated, discomfort-free measurements and illustrating clinical correlations between blood parameters and systemic conditions. Noninvasive blood analyzers, such as Masimo Pronto-7, CRP Sensors, Raman Spectroscopy, and OBC Analyzers provide real-time data on hemoglobin, inflammation, and molecular biomarkers. Oblique Back-Illumination Capillaroscopy visualizes capillary networks. A significant gap in education exists as noninvasive blood analyzers currently provide data on biomarkers but lack of tools for comprehensive complete blood count (CBC)and electrolyte measurement, limiting training on these essential diagnostics. Therefore, we propose Artificial Intelligence integrated blood analyzer that can use for all blood investigations with real-time feedback.

## IMPACT

The integration of AI-linked noninvasive blood analyzers for CBC, Electrolytes, and biomarkers into health care professional (HCP) education presents notable advantages, including enhanced clinical training and improved diagnostic precision without patients' discomfort. Incorporating AI-driven analyzers into educational curricula allows students to engage in practical learning, enhancing their comprehension of blood parameters through real-time data interpretation. The use of AI generated reports in case study discussions promotes critical thinking, preparing future healthcare providers for evidence-based and data driven decision-making. Furthermore, research opportunities utilizing these technologies enable students to examine patterns and trends, contributing to the advancement of evidence-based practice with

repeated analysis. These tools enhance diagnostics, simulation-based learning, and telemedicine in health care professional education. Enhanced comprehension, practical skill development, cost effectiveness, and integration of AI in decision-making can be approached in health education. However, several challenges must be addressed in using AI integrated blood analyzers for HCP education. The significant initial cost of devices and software may restrict access in underfunded settings. Faculty training on the use of AI and diagnostic tools requires both time and financial investment. Additionally, data privacy concerns and the need to comply with ethical standards present ongoing challenges. Addressing these barriers is important for realizing the full potential of AI-blood analyzers in medical education and healthcare practice. In conclusion, integrating AI-driven noninvasive blood analyzers into healthcare education significantly enhances clinical training and diagnostic precision, fostering evidence-based practice and practical learning. By leveraging these advanced tools, healthcare professional education can be transformed, equipping future practitioners with the skills needed for accurate, data-driven decision-making, researches & improved patient care.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

## *AI-Driven Consultation Feedback System for Orthopedic Medical Training: Enhancing Clinical and Communication Skills*

*Faculty of Medicine, University of São Paulo (Brazil)*

AUTHOR
Vitor Matheus Silva, Medical Student

## PURPOSE

Medical students often face challenges in integrating clinical reasoning with effective patient communication, particularly in orthopedic consultations, where effective history-taking and a patient-centered approach are crucial. (1, 2) Traditional assessments, which rely on instructor evaluations, can be inconsistent and limited by faculty availability, leading to fragmented feedback that fails to capture a student's overall progress. (1, 3) In training, students may struggle to structure patient interviews efficiently, ask relevant diagnostic questions, and develop treatment plans aligned with evidence-based guidelines. Additionally, difficulties in establishing empathetic communication can result in a more paternalistic approach, hindering shared decision making. (2) These challenges highlight the need for a system that offers continuous, objective feedback to refine both clinical reasoning and communication skills throughout orthopedic training.

## INNOVATION

This proposal envisions an AI-powered consultation feedback system designed specifically for orthopedic training, providing real-time and longitudinal assessments of students' performance in patient encounters. The AI system could, given adequate patient consent and by means of a simple cellphone app, record the audio and analyze how students conduct orthopedic consultations, ensuring their diagnostic approach aligns with the latest evidence-based guidelines. By assessing the sequence and relevance of their clinical questions, the system would offer feedback on whether students are efficiently gathering the necessary information for an accurate diagnosis and appropriate management. Additionally, the AI would evaluate students' communication strategies, using natural language processing and sentiment analysis to determine their ability to establish trust, listen actively, and engage patients in shared decision-making. This would help address common challenges in medical education, such as the tendency toward hierarchical interactions that may not fully respect patient autonomy. A key advantage of this system is its continuous availability. Unlike traditional assessments, which are limited by faculty time and availability, the AI would be present in every consultation, tracking each student's progress over time. Educators would also be able to customize the system's assessment criteria to align with institutional learning objectives, ensuring that evaluations remain clinically relevant while maintaining a standardized, data-driven approach.

## IMPACT

In the short term, this AI-powered tool would provide immediate, objective feedback to students, allowing them to refine their clinical reasoning and communication skills from one consultation to the next. By making assessments more consistent and removing instructor bias, students would receive fairer evaluations, independent of faculty availability. The system would also encourage patient-centered communication in orthopedic consultations, helping students develop skills that foster trust and shared decision-making while reducing paternalistic tendencies. In the long term, the system could standardize the evaluation of orthopedic medical training, ensuring that all students receive structured and evidence-based feedback throughout their education. The ability to track progress over time would allow institutions to monitor student development more effectively, ensuring that future orthopedic physicians are not only clinically proficient but also skilled communicators. Additionally, reducing the burden on faculty while increasing learning opportunities for students would make medical training more efficient and scalable. By leveraging AI to enhance orthopedic education, this innovation aims to improve both the quality of clinical training and the patient experience in orthopedic consultations.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*The appliance of AI tools for improving professional communication skills in medical education*

*Lithuanian University of Health Sciences (Lithuania)*

AUTHORS

Eimantas Peičius, Medical Student; Eline Alice George, Medical Student; Anugraha Jojy, Medical Student;

Johanna Felicia Wahlstrom, Medical Student; Frida Gonzalez Gonzalez, Medical Student

## PURPOSE

The importance of patient-centred approach and professional communication is highly emphasized in current medical education. However, it requires a new approach to learn and gain compassion, ethical sensitivity, respect for diversity and human rights-based doctor and patient communication. Many AI (Artificial Intelligence) tools, such as chatbots (Chat GPT), started to be used in education and research. The integration of AI potential into the medical education system seems to be inevitable. For instance, AI is being employed by implementing these appliances in reshaping doctors' roles like communicator, collaborator, leader, health advocate, scholar, professional and medical expert in platforms such as CanMEDS or ACGME [1]. Similarly, AI tutors are being adapted to aid the unique learning style and study methods of students in China [2], and the implementation of AI chatbots was used in the USA in certain tutoring systems [3]. We believe that this could also benefit the medical education system by supporting students while also allowing them to virtually practice their soft skills communication while also guiding the students to gain professional practice skills instead of just learning.

## INNOVATION

The importance of patient-centered approach and professional communication is highly emphasized in current medical education. However, it requires a new approach to learn and gain compassion, ethical sensitivity, respect for diversity and human rights-based doctor and patient communication. Many AI (Artificial Intelligence) tools, such as chatbots (Chat GPT), started to be used in education and research. The integration of AI potential into the medical education system seems to be inevitable. For instance, AI is being employed by implementing these appliances in reshaping doctors' roles like communicator, collaborator, leader, health advocate, scholar, professional and medical expert in platforms such as CanMEDS or ACGME [1]. Similarly, AI tutors are being adapted to aid the unique learning style and study methods of students in China [2], and the implementation of AI chatbots was used in the USA in certain tutoring systems [3]. We believe that this could also benefit the medical education system by supporting students while also allowing them to virtually practice their soft skills communication while also guiding the students to gain professional practice skills instead of just learning.

## IMPACT

The use of tools like ChatGPT shows limitations in critical thinking and a lack of referencing, which can lead to the spread of misinformation. AI has the potential to transform medical education, but it requires the ethical use of AI that could improve professionalism [7]. The ethical use of AI can minimize this and foster growth in learning [8]. With the addition of AI tools provided above, students will be able to better communicate with their patients and will also develop the skills required to work under pressure in a high-stress environment while also maintaining empathy. These tools not only enable students to expand their expertise but also allowing them to nurture soft skills such as teamwork and flexibility which are both crucial to working in the medical field.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Developing a Pedigree analysis AI tool within a hospital Electronic Health Record system*

*Faculty of Nursing, University of Colombo (Sri Lanka)*

AUTHORS

H.M.M. Sachini Lakshika Herath, Undergraduate Student; A.R.M. Chamari Asangika Kumari Alawathupitiya, Undergraduate Student; H.W. Piyumi Madurika Kumari, Undergraduate Student

## PURPOSE

Genomic medicine is a trending multidisciplinary specialty and a component of precision medicine, focusing on how an individual's genes influence their overall health. A pedigree is a visual representation of a family's genetic history, specifically use to track the inheritance of a particular trait or genetic disorder across generations. The accurate family history (FH) is an essential element for providing the highest quality of personalized health care. Sri Lankan hospital EHRs currently lack dedicated FH sections. While FH may be recorded in clinical notes in narrative (free-text) format, this approach presents several challenges:

- Under-documentation and under-utilization of family history in clinical practice.
- Lack of standardized practices for timely documentation and updating of the family history.
- Lack of ability to access family health data for interprofessional health-care team.
- Lack of ability to track the inherited data in order to provide personalized care.

## INNOVATION

To address above gaps, we can integrate a pedigree analysis tool into the hospital EHR system. This tool should include following metrics instead of relying on free-text entries. 1) three generations of relatives, 2) relatives' lineage, 3) relatives' gender, 4) an up-to-date FH, 5) diseased individuals noted, 6) age of disease onset in affected relatives. And for deceased relatives, 7) age of death and 8) cause of death. This family health data is easily interpreted when presented in a structured graph (pedigree). If an individual is identified as diseased, the system should automatically update the pedigree and predict the health risks for other family members. Automated messages can then be sent to notify at-risk individuals. Furthermore, the tool can incorporate additional metrics such as 1) Medication history 2) Allergy history 3) Side effects of the drugs This information can be used to predict drug dosage and effectiveness, assess individual responses, and ultimately enhance personalized patient care. Automated reminders can be implemented to prompt the healthcare team to update the FH during each patient encounter, ensuring timely data maintenance. This pedigree analysis tool should be extractable from the EHR and accessible in a confidential manner to all healthcare team members (doctors, nurses, pharmacists, etc.) across various settings (hospitals, outpatient clinics, community).

## IMPACT

Developing this kind of tool will be benefited in wider dissemination of health information among family members and clinicians while reducing data collection time. Linking FH data with genomic risk factors will improve the early diagnosis and treatment of common chronic health conditions (Ex: multifactorial diseases such as cancers, diabetes mellitus, hypertension, dementia etc). By notifying the patients at risk, they can modify their lifestyle and behaviors and do screenings and follow ups in order to prevent from/ early diagnosis of the disease. In long term, gene therapies and pharmacogenomics will be introduced to promote personalized patient care, drug safety and therapeutic effectiveness. Genetic counselling will be promoted (Ex: pre-marital genetic counselling minimizes the inheritance of diseases such as Thalassemia, antenatal counselling) in relevance to Sri Lankan context according to their genetic makeup.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

## *Integration of AI in the Speedwell Exam System for Automated Essay Grading*

*The Aga Khan University (Kenya)*

AUTHORS

Brian Weru Komu, Medical Student; Sarah W. Wambugu, Medical Student; Peter O. Micha, Medical Student;

Brian M. Maina, Medical Student; Ciano W. Ng'ang'a, Medical Student

## PURPOSE

Medical education is often discussed from a student's perspective; how they study, what resources they use, and how they perform in exams. However, little attention is given to the challenges faced by lecturers, particularly when grading essay-based assessments. The current grading processes in many medical institutions rely heavily on manual evaluation, which is time-consuming, subjective, and prone to inconsistencies. With increasing student numbers and the demand for timely feedback, medical lecturers face significant strain in providing fair and comprehensive assessments. A key issue is the variability in grading due to differences in individual markers' interpretations of responses. Additionally, delayed feedback prevents students from identifying and addressing their weaknesses in time. To address these challenges, this proposal explores the integration of artificial intelligence into the Speedwell Exam System to automate essay grading, providing consistent, efficient, and objective evaluation of students' written responses.

## INNOVATION

The integration of AI into the Speedwell Exam System, an online exam software designed to manage and deliver various types of assessments, would use natural language processing (NLP) and deep learning algorithms to evaluate essay responses. The AI would be trained on high-quality, expert-graded essays to learn how to assess content relevance, coherence, structure, and argument strength. By comparing student responses to established grading rubrics, the AI could generate scores and provide constructive feedback instantly. Unlike traditional grading, which can take days or weeks, AI-based grading would allow students to receive immediate feedback, helping them identify areas for improvement before their final assessments. This system would also reduce the grading burden on lecturers, allowing them to focus more on teaching and mentoring. AI-generated grades would initially be cross-checked against human graded essays to ensure accuracy and reliability. Over time, AI will improve through machine learning, adapting to different writing styles and subject matter complexities. Additionally, lecturers would retain oversight, allowing them to review and adjust grades if necessary.

## IMPACT

In the short term, integrating AI grading in Speedwell would streamline the assessment process, reducing the workload for faculty and ensuring fair, unbiased marking. Students would benefit from faster, detailed feedback, helping them refine their writing skills and deepen their understanding of medical concepts. In

the long term, this innovation could transform medical education by promoting a more efficient, data-driven approach to assessment. AI driven grading could be expanded to other forms of written evaluations, such as research papers and clinical case analyses. Moreover, the data collected from AI assessments could help educators identify trends in student performance and adjust teaching strategies accordingly. By embracing AI in assessment, medical institutions can enhance both student learning and faculty efficiency, making the grading process fairer, faster, and more effective.

# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Leveraging AI for Personalized Learning in Medical Education*

*Faculty of Medicine, University of São Paulo (Brazil)*

AUTHORS

Rodrigo D. Martins, Medical Student; Vitor L. Paiva, Medical Student;

João V. Calil, Medical Student; Gabriela E. D'Eugenio, Medical Student

## PURPOSE

In Brazil, the medical course is seen as a promise of wealth and prestige. However, recently, the popularization of this dream has led to an imbalance in the law of supply and demand. The number of available spots for undergraduate programs has increased in both public and private universities, with the aim of better distributing doctors across the country. However, the concentration of doctors in large urban centers has increased, and professional disqualification has also risen due to the excess of undergraduate vacancies and the lack of available spots in residency and specialization programs. Even in top-tier universities, this decline in technical standards has manifested in incoming students' deficiencies in subjects such as chemistry, physics, biology, which professors consider prerequisites for beginning medical training. Similarly, an increasing number of senior students have shown gaps in academic knowledge in various areas of the curriculum. In response to this, the University of São Paulo (USP), for instance, created remedial classes aimed at addressing these deficiencies. Nevertheless, these initiatives are isolated and sporadic, arising from the efforts of students and professors, without the necessary organization to identify and address individual knowledge gaps, even if such an effort is intended. Consequently, the lack of a solid knowledge base for first-year students leads to poor learning outcomes in subsequent content and a lack of direction on how to study, issues that students try to resolve without a structured plan, often by relying on notes from colleagues.

## INNOVATION

To avoid repeating these mistakes, an initiative at the USP School of Medicine, in collaboration with its technology and programming extension group, DevJr, aims to develop an AI system capable of systematically addressing individual learning solutions. The necessary knowledge for each stage of the medical degree would be defined by professors at four key "turning points": upon entering university, at the transition from the basic cycle to the clinical cycle, at the transition from the clinical cycle to the internship, and at the end of the internship. At each of these points, the AI would perform a diagnostic of the individual student's gaps in core learning areas. Based on this, a spreadsheet would be created, cross-referencing students' data to form common interest groups. This approach would go beyond identifying difficulties in specific subjects. The results would be sent to the undergraduate committee, which would organize remedial classes for each group based on their available study time, extending beyond first year students. From the outset, the AI would recommend academic books, specifying the edition, chapter, and pages, so that students could access reliable information, promoting self-initiative in their study methods.

## IMPACT

Thus, initially, this innovation could identify the problem and reduce disparities among students. In doing so, all students would have a common foundation to build their medical-academic knowledge. Subsequently, the system could be further developed to enhance overall student performance, creating a generation prepared for the job market and potential residency programs, capable of innovating in modern medical education.

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# AAHCI Student Leadership Initiative (ASLI): *Abstract*

*Impact of an AI Study Bot on Biomedical Science Student Learning*

*The Aga Khan University (Kenya)*

AUTHOR
Ciano W. Ng'ang'a, Medical Student

## PURPOSE

Traditional preparation for exams in biomedical sciences often relies on passive reading of lecture notes and textbooks, without clear learning objectives or structured guidance on what is most important. This approach can lead to inefficient study habits, difficulty in identifying key concepts, and a lack of targeted preparation for assessments. Additionally, students may struggle to anticipate potential exam questions, limiting their ability to apply knowledge effectively. Recognizing these challenges, the AKU Study Bot was developed as an AI-driven tool to support biomedical science students in their exam preparation. Despite the increasing adoption of artificial intelligence in education, there is limited research on its impact on student learning, engagement, and performance in biomedical sciences. To address this gap, this study aims to evaluate the effectiveness of the AKU Study Bot by assessing student perceptions, usage patterns, and its role in improving study efficiency. By understanding how students interact with AI-driven learning tools, we can determine their potential in enhancing medical education.

## INNOVATION

The AKU Study Bot is an AI-powered tool designed to assist biomedical science students in their exam preparation by providing structured, question-based revision. It generates tailored study questions in medical sciences, supplies corresponding answers, and guides students through targeted revision sessions. Unlike traditional study methods that rely heavily on passive reading, the bot fosters active learning by engaging students with interactive quizzes and immediate feedback. To evaluate the impact of the AKU Study Bot, a cross-sectional study will be conducted among students who have used the tool. A structured questionnaire will be administered to assess student experiences, including perceived effectiveness in improving study habits, understanding of complex topics, and overall exam preparedness. Comparisons will be made between students who have used the bot and those who have relied on traditional study methods to determine its effectiveness. Additionally, qualitative feedback will be gathered to refine and improve the tool’s functionality.

## IMPACT

In the short term, the AKU Study Bot enhances student engagement, improves comprehension of biomedical concepts, and fosters a more structured approach to exam preparation. By providing real-time feedback and adaptive learning resources, students can focus on high yield topics and develop efficient study strategies. In the long term, the integration of AI-driven learning tools in biomedical education has the potential to revolutionize teaching and assessment methodologies. Findings from this study could

inform curriculum development by highlighting the benefits of AI in supporting self-directed learning. Furthermore, insights gained from student feedback will guide future enhancements of AI-based educational tools, ensuring they align with student needs and learning preferences. By leveraging AI for medical education, institutions can foster innovation, improve student outcomes, and prepare future healthcare professionals with a more adaptive and personalized learning experience.

# AAHCI Student Leadership Initiative (ASLI): *Abstract*

## *AI-Enhanced Virtual Reality Classroom for Health Profession Education: Overcoming challenges in treating patients with highly contagious diseases*

*Faculty of Nursing, University of Colombo (Sri Lanka)*

AUTHORS

Ruchini Wijerathne, Nursing Student; Kanishka Madhavi Gampalage, Nursing Student;

Pubudu Malshan Samaranayaka, Nursing Student

## PURPOSE

This study aims to explore the potential of AI enhanced Virtual Reality (VR) technology in health profession education, specifically focusing on overcoming the challenges in treating patients with highly contagious diseases. Even though it is rare to meet patients with highly contagious disease or to face endemic or pandemic situation related to that, continuous educating and training health care staff on the latest infectious diseases and control protocols is essential (Zhang et al., 2024). Yet that could be difficult to achieve due to several challenges like high risk, time, and resource limitation, keeping up with advances and psychological factors (Cochrane Effective Practice and Organization of Care Group et al., 1996).

## INNOVATION

An innovative AI-enhanced Virtual Reality (VR) classroom that combines immersive simulations with adaptive learning can be created to solve the difficulties in teaching medical professionals about highly contagious diseases. In order to produce realistic, interactive situations that mimic interactions with patients affected with infectious diseases like COVID-19, SARS, or Ebola, this smart classroom will combine advanced virtual reality environments with artificial intelligence algorithms. Learners can safely practice patient care, donning and doffing PPE, and infection control in AI-enhanced virtual reality classrooms simulating realistic settings like isolation wards and ICUs. These settings allow for skill development and preparedness for treating highly contagious diseases because they include dynamic AI-driven patients, excellent visuals, haptic devices, and immersive audio-visual signals. By personalizing learning experiences, AI-enhanced virtual reality classrooms are revolutionizing healthcare education. These systems use machine learning to assess decision-making and flexibility by analyzing performance in real-time, finding skill gaps, and dynamically modifying scenarios. Features include the introduction of new symptoms, complications, and resource limits, with AI-powered analytics offering thorough feedback for development. These online classrooms allow trainees from all around the world to participate remotely and learn collaboratively. This innovation bridges the gap between theoretical knowledge and practical skills, helping healthcare workers respond confidently to infectious disease epidemics.

## IMPACT

The integration of AI-enhanced Virtual Reality (VR) smart classroom in health profession education revolutionizes the preparation of healthcare workers for managing highly contagious diseases. By simulating realistic scenarios, this technology bridges the gap between theoretical knowledge and practical skills, allowing healthcare professionals to gain hands-on experience in a risk-free environment. AI-powered adaptive learning enhances decision-making and infection control proficiency, reducing errors during real-life situations (Zhang et al., 2024). As well as accessibility & scalability also good impact of VR stimulation can be easily scaled to train large numbers of healthcare professionals simultaneously. (Hamilton, 2024). The accessibility of virtual classrooms ensures equitable training opportunities globally, addressing resource and geographical disparities. Controlled environments alleviate psychological stress, increasing confidence and preparedness. However, challenges like ethical concerns, and the potential for overreliance on VR to diminish real-world clinical skills must be addressed. Moreover, VR may not fully have captured the emotional and psychological stress of real-world outbreaks (Liu et al., 2024). Cost of Implementation is high practicing AI-enhanced VR for Health Profession Education (Levett-Jones & Lapkin, 2012). Despite these limitations, AI-enhanced VR improves healthcare outcomes and strengthens pandemic preparedness.

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