

AI in Health Professions Education: Insights and Future Directions
Report on the Brescia 2024 Conference on Artificial Intelligence

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Executive Summary

The Brescia 2024 Conference, held May 3-4, 2024, brought together academics, healthcare professionals, and students from Europe, North America, Africa, and Italy to discuss AI's impact on health professions education. Presentations covered AI's potential to revolutionize teaching, learning, and healthcare, as well as the ethical concerns surrounding its use.

Key topics included AI's role in creating personalized learning pathways, enhancing workflow efficiency, and improving clinical training through tools like 3D scans and virtual simulations. While AI offers numerous benefits, participants stressed the importance of maintaining ethical standards, academic integrity, and ensuring educators and students develop AI literacy.

Challenges discussed included data privacy, plagiarism risks, and the need for robust guidelines to prevent AI misuse. Despite these concerns, the conference highlighted the vast opportunities AI presents, including improved assessments, personalized feedback, and time-saving tools.

Participants concluded that while AI can enhance education and healthcare, critical thinking, and ethical considerations must remain central to its integration. Moving forward, fostering AI literacy and developing ethical guidelines are essential to ensuring its responsible use.

Context

On May 3-4, 2024, a dynamic group of academics from Europe, Africa, Canada, the USA, along with Italian dental and ERASMUS graduate students, gathered in Brescia, Italy, for a pivotal discussion on the integration of Artificial Intelligence (AI) in health professions education. The conference explored AI's transformative role, from its basic definitions to advanced applications in healthcare, teaching, and prompt engineering. Discussions also touched on the ethical implications and best practices for incorporating AI into academic research and healthcare. The participants' insights and experiences were captured through engaging presentations, Q&A sessions, live polling, and roundtable discussions.

What follows is a comprehensive report highlighting the key presentations, participant feedback, and the potential challenges and opportunities AI presents to health professions education.

Day 1 Highlights: Transforming Health Professions Education with AI

Transforming Learning and Teaching with AI

Dr. Mary Webb opened the conference with a thought-provoking session on how AI is reshaping education. She highlighted the personalized learning pathways that AI enables, making it easier for students and teachers to navigate complex subjects. While AI offers powerful learning tools, Dr. Webb emphasized the need for educators to maintain ethical and academic standards as AI becomes more integrated into curricula.

AI as a Personal Assistant

Dharmesh Chauhan provided an insightful presentation on AI's role in enhancing workflow efficiency for educators and healthcare professionals. He underscored the importance of using AI responsibly, positioning it as a personal assistant that optimizes routine tasks. This would allow more time for complex problem-solving and improving patient care.

AI in Health Professions Education

Professors *Dieter Schonwetter*, *Kathy Yerex*, *Kaleigh Warden*, *Laura MacDonald*, and *Caroline Monin* shared perspectives from Canada and the USA. Their presentation examined AI's evolving role in assessing student skills, providing feedback, and enhancing classroom dynamics. While AI offers new assessment methods, it raises critical questions about its role in formative and summative evaluations. The team discussed the potential for AI to act as both a teaching assistant and mentor in future educational models.

Academic Integrity in a Post-AI World

Professor Stylianos Hatzipanagos tackled the challenges of maintaining academic integrity in the era of generative AI tools like ChatGPT. With students now able to generate AI-assisted responses, Prof. Hatzipanagos stressed the need for robust ethical guidelines to ensure students remain engaged in critical thinking and independent learning.

Practical AI Applications in Dental and Health Classrooms

Dr. Laura MacDonald and her team shared success stories from their experience using AI in dental and health classrooms. Early adoption of AI tools has led to innovations like AI-powered 3D scan analysis and virtual simulations, providing students with hands-on clinical experience.

AI and Libraries: A Librarian's Perspective

Hal Loewen, a librarian from the Rady Faculty of Health Sciences, Canada, explored how AI is being integrated into libraries. He highlighted the long history of AI in library settings, ethical concerns such as copyright issues, and the challenges posed by AI in information management. Mr. Loewen emphasized the importance of fostering AI literacy among librarians to keep pace with rapid technological developments.

MirandaNet: AI and Professional Development

The *MirandaNet* group presented their ongoing initiatives to help educators navigate digital technologies, with a particular focus on AI as a tool for both informal networking and professional development.

Engaging Participant Feedback and Insights

Throughout the event, attendees actively contributed to discussions via live polls, roundtable sessions, and a needs assessment survey. Their input shed light on the real-world application of AI in health professions education and personal life.

AI in Everyday Life: Efficiency Meets Ethical Concerns

Participants overwhelmingly noted the profound impact AI has had on their daily lives. Whether used for academic tasks, personal conveniences, or work efficiency, AI was seen as a game-changer. However, mixed sentiments were expressed regarding its integration, with some attendees expressing concerns about its overuse and the potential negative impacts on mental health and student engagement.

AI in Health Professions: Emerging Trends

Attendees noted that AI is becoming increasingly integrated into health professions education, particularly in areas such as assessments, feedback, and clinical applications like radiograph analysis. However, a significant number of educators are still hesitant to fully embrace AI, citing concerns over ethical implications, data privacy, and a lack of necessary skills.

Challenges and Opportunities of AI in Education

Participants identified several challenges, including:

- **Ethical and Regulatory Issues:** A major challenge identified by respondents is the ethical implications of AI use, including concerns about data privacy, patient confidentiality, and regulatory issues. Several participants mentioned the need for AI to maintain ethical standards, particularly in health education.

- **Trust and Information Validity:** Trust in AI-generated information is a recurring theme, with concerns about false information, source validity, and the need to verify data. There is a lack of confidence in whether AI-provided information is accurate or reliable, necessitating double-checking by educators and students.
- **Plagiarism and Cheating:** The potential for misuse of AI by students, particularly with regards to cheating and plagiarism, was frequently mentioned. Educators are concerned about how to discern if students have genuinely understood the material or relied excessively on AI.
- **Critical Thinking and Humanity:** There is a fear that AI may undermine critical thinking skills, with some respondents emphasizing the importance of maintaining humanity and critical reasoning in education. AI should not replace the cognitive engagement required for learning.
- **Skills and Equity:** A challenge in using AI is ensuring that both educators and students have the skills to use it effectively. There are concerns about discrimination against students with limited IT skills, and the need to maintain equity in AI access and usage.
- **Efficiency and Timesaving:** AI's ability to save time by handling routine tasks is seen as an advantage, but respondents emphasized the need to balance efficiency with maintaining quality in education. Ensuring AI is used appropriately to support teaching, rather than replace meaningful engagement, is essential.
- **Adaptation to AI in Teaching:** Extending current teaching modalities to integrate AI is challenging, as educators need to adjust their approaches. Incorporating AI into teaching requires flexibility and a reassessment of educational outcomes and methods.

Conversely, opportunities include:

- **Efficiency and Time Savings:** AI offers significant opportunities to streamline tasks such as searching for information, processing large datasets, and tackling basic or repetitive tasks, allowing educators to focus on more complex issues. This includes "quick search for information," "release experts' time," and "avoid basic work."
- **Enhanced Learning and Teaching:** AI facilitates better-informed students and teachers by providing immediate access to a vast amount of data. It also improves teachers' confidence and helps in delivering more flexible and engaging content, as seen in "better informed students and teachers," "better skill use," and "virtual simulations."
- **Improved Patient Care and Skill Development:** AI enables more integrated patient care and advanced training opportunities, particularly through simulations and specialized skills training, contributing to "better integrated patient care," "training skills," and "treatments will get better."
- **Broader Access to Education:** AI can provide educational opportunities in isolated regions and improve study-life balance by offering more flexible learning and teaching

environments, supporting themes like "providing training in isolated regions" and "study life balance."

Key Lessons Learned

Participants reflected on the most valuable lessons they gained from the keynote presentations. Many left with a greater appreciation of AI's vast capabilities and its potential to revolutionize personalized medicine, education, and patient care. Key takeaways include:

- **Understanding AI:** Attendees deepened their understanding of AI's complexity, particularly its applications in education and healthcare. Ethical concerns, such as safeguarding data and public accessibility to sensitive information, were highlighted. Many noted a greater appreciation of AI's vast capabilities, especially in contexts beyond their initial expectations, such as ChatGPT's utility in tackling even the most complex topics.
- **Capabilities of AI:** AI's potential to revolutionize personalized medicine was a significant learning point. Attendees saw the potential for AI to tailor healthcare solutions, improving precision in treatment and care.
- **How to Use AI:**
 1. **Preliminary Level:** Many participants gained foundational skills in using AI correctly and efficiently. They recognized the importance of generating good prompts and the value AI can add to their work, provided it's used with caution and information is always double-checked. AI was seen as a tool to enhance creativity, rather than a threat, with emphasis on maintaining personal judgment and integrity in its application.
 2. **Advanced Level:** At a more advanced stage, attendees explored AI's role in progressing health science education, fostering collaboration, and encouraging critical thinking. They discussed the importance of corroborating AI-generated information and using AI as a tool for self-challenge and educational innovation. A strong theme emerged around the need for critical, literate engagement with AI, and the vital role of teamwork between educators and students to advance the benefits AI can bring to education.

Day 2: Looking Ahead—AI in Health Professions Education

The second day continued with deeper explorations of AI's role in healthcare and education through round table discussions in one of 5 groups: Student-Centred Learning and AI; Assessment and AI; Future Considerations (note two of the groups' summaries are missing). Captured below are three of these groups' summary reports.

- **Student-Centred Learning and AI:** Professor Michael Botelho facilitated discussions on how AI can be utilized to support student-centered learning. Students are not passive recipients of information, but instead, AI tools can help them engage in interactive learning. While some participants voiced concerns about AI replacing human interaction, others highlighted AI's ability to act as a study partner, enhancing collaborative and active learning environments.
- **Assessment and AI:** Laura MacDonald led a session on using AI in assessment within health education. AI's ability to provide personalized feedback, streamline evaluation processes,

and adapt assessments to individual learners' progress was discussed. However, concerns were raised about AI being the sole tool for evaluation, and the importance of maintaining human oversight was emphasized.

- Future Considerations: Dharmesh and Sue explored the future of healthcare and education with AI, emphasizing the need to future-proof students by equipping them with skills to navigate technological advances. This includes fostering resilience, confidence, and AI literacy, ensuring that students can harness AI as a tool for both personal and professional growth.

Key Opportunities:

- AI-driven simulations and virtual environments offer immersive learning experiences in health professions, especially in clinical education.
- AI facilitates personalized learning and instant feedback, enabling educators to focus on higher-order teaching while AI handles routine tasks.
- Big data analysis in healthcare education allows for more in-depth research and better patient care insights.

Key Challenges:

- Ethical concerns and the risk of misuse (e.g., plagiarism) in educational settings.
- Ensuring student engagement without over-reliance on AI tools.
- Maintaining academic integrity and developing a balanced, critical approach to AI's role in education and assessment.

Future Directions: Harnessing AI's Full Potential

In the closing sessions, attendees explored how to effectively use AI in both basic and advanced health education settings. While many saw AI as a tool to augment their teaching and clinical practices, they emphasized the importance of maintaining personal judgment and critical thinking in the face of increasingly sophisticated AI tools.

Attendee's Needs Assessment for Future Meetings

As seen in Table 1 and based on feedback from attendees at the Anglo-Italian meetings, the

Table 1: Frequency Analysis of Topic(s) to Consider for 2025 (n=22).

Topic Categories and Themes	Frequency	%	Total %
AI	29		69.05%
Dental education: learning, learning designs, students' views	6	19.35%	14.29%
Assessment: formative, clinical	4	12.90%	9.52%
Tool for teaching/informatics	4	12.90%	9.52%
AI literacy, workshops, hands-on, real life, practical applications	4	12.90%	9.52%
Academic research, ethics, and publications	3	9.68%	7.14%
Advances and dangers	2	6.45%	4.76%
University policy and regulations	2	6.45%	4.76%
Food and Drink: making good coffee and Italian cuisine	2	6.45%	4.76%
Prompting engineering	2	6.45%	4.76%
Neural networks, universities as	2	6.45%	4.76%

Other	13		30.95%
Holistic medicine, integrated care, wellbeing	3	23.08%	7.14%
Virtual Reality	3	23.08%	7.14%
Community-based growth	1	7.69%	2.38%
Communication in health	1	7.69%	2.38%
Investigation ideas	1	7.69%	2.38%
Psychology	1	7.69%	2.38%
Social media	1	7.69%	2.38%
The supported clinician	1	7.69%	2.38%
Tools for MDT work	1	7.69%	2.38%
Total	42		100%

planning team for next year's academic talks on AI are encouraged to consider on a range of high-priority topics. These include the integration of AI in dental education, particularly regarding learning designs, student perspectives, and clinical assessments. Workshops and hands-on sessions that promote AI literacy, practical applications, and tool use in teaching should also be prioritized. Additionally, discussions on the ethics of AI in academic research and publications, advances and risks of AI, as well as university policies and regulations, will be key areas of interest. Prominent technical topics, such as prompt engineering and neural networks, should be considered for inclusion.

Conclusion: A Transformative Tool with Boundless Potential

The Brescia 2024 conference underscored AI's transformative power in health professions education. From enhancing teaching efficiency to revolutionizing clinical training, AI presents both opportunities and challenges. As educators continue to explore its full potential, maintaining a balance between technological innovation and ethical integrity will be critical.

Through these two days of engaging discussions and hands-on exploration, participants gained not only a better understanding of AI's current applications but also a roadmap for navigating its future in education and healthcare.

Next Steps: Fostering AI Literacy and Ethical Practices

Moving forward, the importance of AI literacy for both educators and students is paramount. Integrating ethical guidelines and ensuring equitable access to AI tools will help educators harness AI's full potential while maintaining the integrity of health professions education.

Appendices

What is the most important thing(s) you have learned during this time together?

- What AI is:
 - Complexity
 - I learnt a lot about AI used in Education and Healthcare. Safeguarding needs to be thought about as more information can be accessible by the public and ethical issues.
 - I've learned that chat GPT is more than what I thought it is, I've learned that we can use it for absolutely any topic even if it's a really complicated one
- What AI can do
 - AI and the capacity to improve the personalized medicine in some areas of health
- How to use AI
 - Preliminary level
 - how to use correctly and efficiently
 - How useful AI can be, if we know how to use it properly
 - If we use AI correctly, it is an excellent resource.
 - If you use it with a good prompt, it would be so useful and interesting
 - To use AI as a tool that improves my own ideas
 - It is ok and even recommended to use AI in your studies and projects, but you always have to double check the information
 - possibility of using artificial intelligence as a resource and not as a threat
 - Writing prompts
 - to not be afraid of using AI, but to be wary of the given information and to double-check the info
 - Using the AI when learning
 - That AI is going to be with us, we have to be Friends, and learn to use it
 - That finally I need to use my own judgment when I use AI.
 - Advance level
 - How to progress in didactics in health science
 - That, again, knowledge has to be built on freedom, information and collaboration, for the common good.
 - Importance of teamwork
 - How to use it to challenge myself and question myself
 - Corroborate the information
 - Try ChatGPT, be aware of integrity issues, think about creativity and AI.
 - Importance of critical, literate engagement
 - The importance of a mutual collaboration between educators and students to improve education through AI

What would you still like to learn? What is missing?

- Consider the drivers of AI; More educational and ethical research into AI, More international collaboration in AI.
- First steps in prompt engineering
- Guided practical session
- How to adapt from every health field to the imposition of AI
- How to best use the various AI instruments
- How to correctly use prompts
- How to integrate the AI in the health science R&D to industry.
- How to search information
- How to use AI in a constructive way to promote critical thinking and not plagiarism.
- How to use AI in healthcare
- I would like to learn better how to use it and how to formulate questions to obtain good answers
- Include students' perspective
- learn to make good coffee AND understand how artificial intelligence works, to know how to use it from knowledge and not from fear
- More clinical use of ai
- more info related to the use of AI in medicine
- More uses
- The interference in students' social life and creating new AIs for targeted investigation research
- The way AI really works, and the ways it uses us.
- Uses in Health sciences
- Which tools for which tasks

How does AI impact your daily life?

- Affecting the ways we teach and learn
- Allows me to do things that were completely out of my realm of possibility
- Almost everything
- As a tool it speeds up the process of information processing in scientific articles
- As an academic librarian it has a huge impact on my work. Systems are changing and need to understand how to use it.
- As soon as I leave my house, I change the temperature using AI. I implemented the use of OpenAI in my daily tasks. We can use more examples, but our lives are totally impacted
- Considerations for use of AI in education - as an academic journal editor, how to discern its use.
- Efficiency massive information
- Every time I go online
- Finding out how poorly structured and ungrammatical English is used in a language learning app!
Identifying plants in local area
Getting lost following maps in London - learning how to find places
- Gets my students to write their essays
- Helps me to adapt
- Helps with drafting letters, Finding summarised, checking directions Not really used for research yet
- I don't usually use it and sometimes it can't even help me
- I use AI every day including planning my wife's 50th birthday.
- I use AI for University tasks, fore keep contact whit my family and friends, but i want to say that I like real life, not the life behind a monitor. I don' t like AI.
- I use it every day as a resource that helps me doing my daily activities like correcting texts ...
- it influences my daily life helping me in different activities like research
- It offers me more Time
- Lots of ways
- Low impact, I rarely use AI. It is very useful for research in order to collect large amount of data/info
- makes it easier
- Makes it easy to get a draft prepared of my research reports
- Making easier routine tasks
- More anxious students validated by Dharmesh's survey
- Not much at present
- On Instagram reels AI can lead me on what are my interests, without Ask me any questions
- Only thru my job
- plan my travels, giving traffic information, operating my household machines, helping literature search
- Search for new methods to develop in vitro models for approaching pediatric brain tumors.
- Solution in a short time
- To improve knowledge
- we use in our daily lives the voice assistants on our mobile phones
- Worrying evidence that websites are breaking down

How have you used AI in health profession education?

- Active lecturing Evaluation Discussion
- appointments
- Assessment
- Assessment Feedback
- Exams
- Feedback
- Follow-up
- Haptic feedback Analysing_3D_scans Assessment
- Information
- Information
- Knowledge follow-up
- Lectures Case study MCQ
- Literature Review Information
- Making a structure
- no
- No
- No
- No No No
- No Not yet
- Not yet
- Planning procedure Implant positive Orthodontic developments
- radiograph evaluation
- Test technology Fun
- Time saving on some tasks
- To inspire To speedup Specialise
- Understand mechanisms
- Virtual simulations

What are the challenges in using AI in health education

- Outcomes
- Affordance
- Ensuring right question.
- Ethical issues
- Ethical issues
- Extended our thinking modality of teaching to AI
- false information
- Having to double check
- Humanity
- Keep our critical thinking
- Knowing what has been done by students and whether they have understood what they profess to have learnt
- Misuse
 - Cheating
- Plagiarism
- Precisión medicine
- Reliability
- Source validity
- The information might be false
- Trust
- Trust lacking
- trust the source
- Understanding if the data given by AI are true
- Verifying the information
- Where is the data from does it affect patient confidentiality?
- Degree of speciality
- Ethical/Regulatory issues
- false information
- flexible teaching
- Save time
- Staff skills in using AI
- Time saving - doing the donkey work
- Avoiding discrimination against students who have limited IT skills
- Maintaining equity
- Saving time

What are the AI opportunities in health education?

- Access to massive amount of information almost simultaneously with ask
- Better informed students and teachers
- Better integrated patient care
- Better knowledge
- Better skill use
- Easier to be a confident teacher
- Easy to search specific data
- Facilitating big data analysis
- immediate solutions
- Less work
- Major organisation
- more flexibility for lecturer
- Quick search for information
- Release experts time to tackle more challenging teaching issues
- Study life balance
- Training skills
- Treatments will get better
- Virtual simulations
- Avoiding v basic work
- constantly updating information
- Providing training in isolated regions

What topics should be considered for the 2025 Anglo-Italia meetings?

- Academic research
- Advances and dangers
- AI and ethics
- AI and publications
- AI learning
- AI learning designs
- AI literacy
- AI workshops
- Clinical assessment using AI
- Communication in health
- Community-based growth
- Dental education and AI
- Food and Drink: making good coffee and Italian cuisine
- Hands-on AI
- Holistic medicine
- Integrated care
- Investigation ideas
- Neural networks, universities as
- Practical applications
- Prompting engineering
- Psychology
- Real life
- Social media
- Students' views on AI
- Teaching informatics
- The supported clinician
- Tool for teaching
- Tools for MDT work
- University policy and regulations
- Using AI for assessment
- Using AI for formative assessment
- Virtual Reality
- Wellbeing