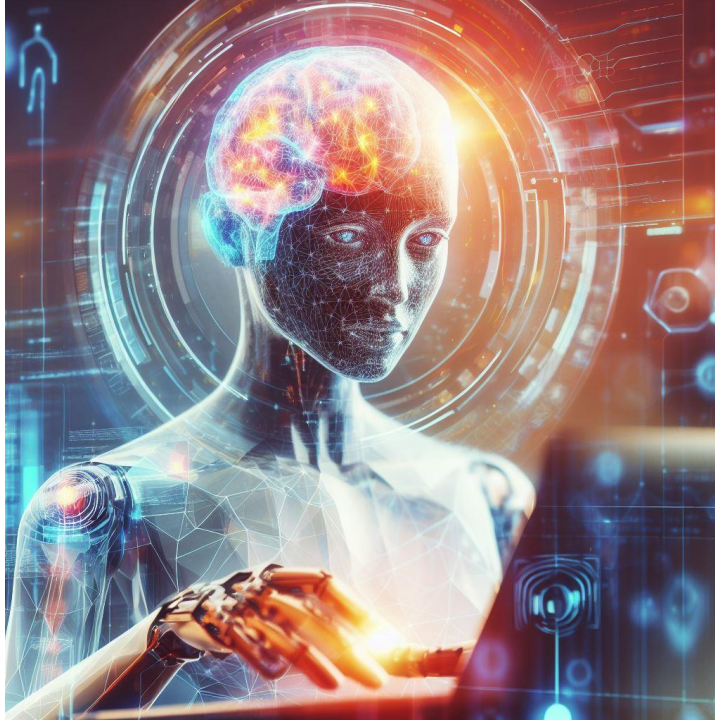
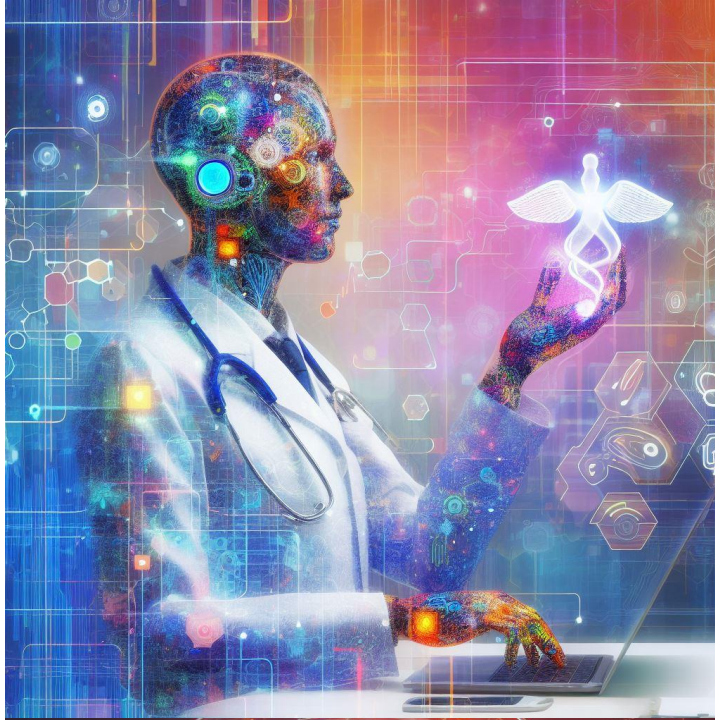


AI for research

Michael Rowe
Associate Professor for Digital Innovation
School of Health and Social Care
University of Lincoln, UK

Prompt: "a coloured female academic using artificial intelligence to conduct research, impressionism" (DALL-E, via Microsoft Image Creator)



Using AI to write scholarly publications

Mohammad Hosseini , Lisa M. Rasmussen & David B. Resnik 

Received 11 Jan 2023, Accepted 11 Jan 2023, Published online: 25 Jan 2023

 Cite this article  <https://doi.org/10.1080/08989621.2023.2168535>



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Artificial intelligence (AI) natural language processing (NLP) systems, such as OpenAI's generative pre-trained transformer (GPT) model (<https://openai.com>) or Meta's Galactica (<https://galactica.org/>) may soon be widely used in many forms of writing, including scientific and scholarly publications (Heaven 2022).¹ While computer programs (such as Microsoft WORD and Grammarly) have incorporated automated text-editing features (such as checking for spelling and grammar) for many years, these programs are not designed to create content. However, new and emerging NLP systems are, which raises important issues for

The future of medical education and research: Is ChatGPT a blessing or blight in disguise?

Taha Bin Arif  , Uzair Munaf  & Ibtehaj Ul-Haque 

Article: 2181052 | Published online: 21 Feb 2023

 Cite this article  <https://doi.org/10.1080/10872981.2023.2181052>



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To the editor,

With the rapid evolution of scientific literature and technology, experts rely more on new artificial intelligence models for convenience and easy access to needs. The introduction of extensive language model tools by Google and Meta use programs by taking human prompts and devising sophisticated

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ACCOUNTABILITY IN RESEARCH, 2023
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LETTER TO THE EDITOR



Using ChatGPT to conduct a literature review

Michael Haman  and Milan Školník 

Department of Humanities, Czech University of Life Sciences Prague; Prague, Czech Republic

Dear Accountability in Research Editors,

In this letter, we consider the ethical and practical implications of using ChatGPT in the research process. The ethics of using ChatGPT have been debated in both the public and academic literature since its inception (Hosseini, Rasmussen, and Resnik 2023). However, only some dare to suggest that tools similar to ChatGPT could replace the entire research process. Some views have been expressed that similar services could replace at least part of

A SWOT analysis of ChatGPT: Implications for educational practice and research

Mohammadreza Farrokhnia , Seyyed Kazem Banihashem , Omid Noroozi   & Arjen Wals 

Published online: 27 Mar 2023

 Cite this article

 <https://doi.org/10.1080/14703297.2023.2195846>



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ABSTRACT

ChatGPT is an AI tool that has sparked debates about its potential implications for education. We used the SWOT analysis framework to outline ChatGPT's strengths and weaknesses and to discuss its opportunities for and threats to education. The strengths include using a sophisticated natural language model to generate plausible answers, self-improving capability, and providing personalised and real-time responses. As such, ChatGPT can increase access to information, facilitate personalised and complex learning, and decrease teaching workload, thereby making key processes and tasks more efficient. The weaknesses are a lack of deep understanding, difficulty in evaluating the quality of responses, a risk of bias and discrimination, and a lack of higher-order thinking skills. Threats to education include a lack of understanding of the context, threatening academic integrity, perpetuating discrimination in education, democratising plagiarism, and declining high-order cognitive skills. We provide agenda for educational

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Liubov Skavronskaya
Journal of Teaching in
Published online: 30 M

Readership Awareness and ChatGPT - Ethic

Background

- Large language models are next-word-predictors.
- Training data cut-off in 2021, so responses only include information prior to this.
- All language models hallucinate all the time (it's just that sometimes, the hallucinations look real).
- Language models have no anchor to reality (no reference frame).
- Language models have no concept of 'right' or 'wrong'.
- Even when we know better, we tend to anthropomorphise LLM responses.

Recent headlines

- Blecher et al. (2023, Aug 25). [Meta's latest AI model makes scientific PDFs machine-readable.](#)
- Mehreen, K. (2023, July 4). [Advanced Techniques for Research with ChatGPT.](#)
- Schreiner, M. (2023, July 10). [GPT-Researcher is an AI agent for autonomous research.](#)
- Carrigan, M. (2023, June 27). [The impending automation of grant writing.](#)
- Bastian, M. (2023). [ChatGPT does years of student research in a fraction of an hour.](#) THE DECODER.
- Senel, B. (2023). [Exploring ChatGPT in Research and Education.](#) Sage.
- Carrigan, M. (2023, May 29). [Talking to ChatGPT about my PhD.](#)
- van Dis, E. A. M., Bollen, J., Zuidema, W., van Rooij, R., & Bockting, C. L. (2023). [ChatGPT: five priorities for research.](#) Nature, 614, 224–226.

Research assistant

Literature reviewer

- *I need help with a literature review on blended learning and the most up-to-date research on its integration into health professions education. Can you provide me with an overview of the current state of research in this area?*
- Here's an overview of the current state of research, as of my last knowledge update in January 2022:
 - Definition and Models of Blended Learning:
 - Effectiveness of Blended Learning
 - Flexible Learning Environments
 - Technology and Tools
 - Assessment and Feedback
 - Emerging Trends

Research assistant

Idea generator

- *I'm interested in the topic of generative AI in scholarly practice and would like to do a PhD in the area. Do you have any suggestions for research questions that I could explore?*
 - What are the ethical implications of using generative AI to assist with academic writing and research? Issues around authorship, originality, and transparency could be examined.
 - How might generative AI impact knowledge production and dissemination in academia? You could investigate effects on collaboration, peer review, publishing models, etc.
 - What challenges do scholars face in evaluating and critiquing generative AI outputs? Studies could identify gaps in interpretability and benchmarking.
 - What biases exist in current generative AI systems and how can they be mitigated? Testing systems across different domains and datasets would reveal limitations.

Research assistant

Summariser and analyser

- *Summarise and analyse these responses to the question, "What do you believe makes a competent healthcare professional?"*
 - [copy and paste transcript]
1. Assessment and Clinical Skills.
 2. Communication.
 3. Continuous Learning and Development.
 4. Ethical and Professional Behaviour.
 5. Holistic Care.

Research assistant

Data analysis

- What language models can do with a corpus of text:
 - Sentiment analysis.
 - Topic modeling.
 - Text classification.
 - Keyword extraction.
 - Named entity recognition.
 - Summarisation.
 - Comparison analysis.
 - Data validation.

Research assistant

Grant writing (webinar)

- How to intelligently prompt ChatGPT with the contextual knowledge it will require to write your grant well — *using the funding body's grant proposal guidelines*, past successful applications...
- You will learn how to synthesize complex research goals into compelling and digestible content for potential national and other funding bodies, ensuring adherence to formal grant guidelines but also more subtle normative rules for grant applications...
- The practicalities of using AI to maintain alignment with the ever-changing landscape of grant funding will also be discussed...

Synthetic data generation



Services

- **Claude / ChatGPT**: Generic, language-related interactions.
- [ResearchRabbit](#): Reimagine Research. We're rethinking everything: literature search, alerts, and more.
- [Elicit](#): Automate time-consuming research tasks like summarizing papers, extracting data, and synthesizing your findings.
- [Explainpaper](#): Upload a paper, highlight confusing text, get an explanation. We make research papers easy to read.
- [GPT Researcher](#): The agent can produce detailed, factual and unbiased research reports, with customization options for focusing on relevant resources, outlines, and lessons.

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Programmatic assessment

RossBhanji2021

Key considerations in planning and designing programmatic assessment in competency-based medical education.

Medical Teacher

TimmermanDijkstra2017

A practical approach to programmatic assessment design

Advances in Health Sciences Education

HeenemanVleuten2021

Ottawa 2020 consensus statement for programmatic assessment - 1. Agreement on the principles.

Medical Teacher

ZoanettiPearce2020

The potential use of Bayesian Networks to support committee decisions in programmatic assessment.

Medical Education

VleutenHeeneman2015

Twelve Tips for programmatic assessment

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TorreHeeneman2022

An international study on the implementation of programmatic assessment: Understanding challenges and exploring solutions

Medical Teacher

RichHall2022

Do Resident Archetypes Influence the Functioning of Programs of Assessment?

Education Sciences

ColbertBierer2022

The Importance of Professional Development in a Programmatic Assessment System: One Medical School's Experience

Education Sciences

CarraccioSchumacher2021

Identifying Core Components of EPA Implementation: A Path to Knowing if a Complex Intervention Is Being Implemented as Intended.

Academic Medicine

AndersonWest2021

Implementation and Use of Workplace-Based Assessment in Clinical Learning Environments: A Scoping Review.

Academic Medicine

TorreVleuten2021

Ottawa 2020 consensus statements for programmatic assessment

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Dario Torre

Sylvia Heeneman

An international study on the implementation of programmatic assessment: Understanding challenges and exploring solutions

Medical Teacher

2022

1 PDF

Programmatic assessment is an approach to assessment aimed at optimizing the learning and decision function of assessment. It involves a set of key principles and ground rules that are important for its design and implementation. However, despite its intuitive appeal, its implementation remains a challenge. The purpose of this paper is to gain a better understanding of the factors that affect the implementation process of programmatic assessment and how specific implementation challenges are managed across different programs. An explanatory multiple case (collective) approach was used for this study. We identified 6 medical programs that had implemented programmatic assessment with variation regarding health profession disciplines, level of education and geographic location. We conducted interviews with a key faculty member from each of the programs and analyzed the data using inductive thematic analysis. We identified two major factors in managing the challenges and complexity of the implementation process: knowledge brokers and a strategic opportunistic approach. Knowledge brokers were the people who drove and designed the implementation process acting by translating evidence into practice allowing for real-time management of the complex processes of implementation. These knowledge brokers used a 'strategic opportunistic' or agile approach to recognize new opportunities, secure leadership support, adapt to the context and take advantage of the unexpected. Engaging in an overall curriculum reform process was a critical factor for a successful implementation of programmatic assessment. The study contributes to the understanding of the



What is the best way to integrate programmatic assessment into a competency-based health professions programme?

Summary of top 4 papers

The papers provide insights into the integration of programmatic assessment into competency-based health professions programs. [Bok 2013](#) emphasizes the importance of aligning assessment instruments with predefined competencies and providing meaningful feedback to students. [Schut 2020](#) highlights the benefits of programmatic assessment, such as enabling robust decision-making and catalyzing learning, but also identifies challenges like assessment overload and lack of shared understanding. [Samuel 2023](#) evaluates a competency-based program and finds that learners reported significant growth in competencies over time, with variations across domains. [Mahajan 2021](#) discusses the potential of blended programmatic assessment, particularly in the context of transitioning to online assessments. Overall, the papers emphasize the need for careful preparation, faculty development, and attention to feedback quality in implementing programmatic assessment in health professions programs.

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Paper

Abstract summary



Programmatic assessment of competency-based workplace learning: when theory meets practice

[Harold GJ Bok](#) +9

[BMC medical education](#)

2013 184 citations

A program of assessment with low-stakes assessments providing simultaneously formative feedback and input for summative decisions proved not easy to implement.



Where the rubber meets the road — An integrative review of programmatic assessment in health care professions education

[Suzanne Schut](#) +5

[Perspectives on medical education](#)

2020 16 citations

Programmatic assessment was found to enable meaningful triangulation for robust decision-making and used as a catalyst for learning.



Evaluating a Competency-Based Blended Health Professions Education Program: A Programmatic Approach.

[A. Samuel](#) +4

[Military Medicine](#)

2023 1 citation

Programmatic evaluation of competency-based education programs should enable the inclusion of the learner's voice.



[Blended programmatic assessment for competency based curricula](#)

Programmatic assessment encourages the deliberate and longitudinal use of diverse assessment

less believe that health professionals are more immune than most to the effects of AI, with so-called “caring professions”, such as nursing, psychology and social work, being the most secure (Brynjolfsson and McAfee, 2018; Ford, 2017; Susskind and Susskind, 2016). But health professionals are expensive to educate and employ and they are often overqualified for many of the tasks included in their job descriptions (Blomqvist, Busby, Jacobs, and Falk, 2015; Rule and LeGouill, 2019; Susskind and Susskind, 2016). As Susskind and Susskind (2016) argued, “we cannot afford [professionals], they are often antiquated, the expertise of the best is enjoyed only by a few, and their workings are not transparent”.

Given the uncertainties and perceived opportunities and threats offered by the technological changes we anticipate in healthcare, we attempted to answer the following three questions in this paper: 1) What kinds of AI-based systems are being introduced into the health sector; 2) Which tasks within physiotherapy practice are likely to be automated as a result of the introduction of these AI-based systems; and 3) What is likely to become of the profession of physiotherapy with the automation of these tasks? Our aim is to explore the potential implications of AI and machine learning on a variety of tasks that practitioners may regard as being central to physiotherapy practice and to encourage physiotherapists to reflect on how the profession may need to change in response to the introduction of these emerging technologies.

Our position

Before embarking on our discussion, we thought we should present our various perspectives and positionings in relation to the theme of the paper. We are three physiotherapy educators from South Africa, New Zealand, and Canada, with a longstanding interest in the future of the physiotherapy profession. As well as being practitioners, we have backgrounds in sociology, philosophy, health policy, education, and ethics. We are all founding members of the Critical Physiotherapy

post-humanism and post-qualitative inquiry. These approaches share a belief in the social construction of knowledge, and they are critical of realist beliefs in mind-independent truth. Social ‘facts’, for critical theorists and ‘posts’ are contested and discursive, and created in social networks. They are fluid and context-dependent, and have strong links to history, language, power, and culture (Eisenberg, 2010; Gibson, 2016; Nicholls, 2012; Shaw and DeForge, 2012).

AI systems being introduced into the health sector

The field of AI consists of several subdomains, including natural language processing (NLP) and speech recognition, vision and perception, machine learning, computer-aided instruction, robotics, and expert systems (Susskind and Susskind, 2016). Of these subdomains, machine learning (ML) has emerged as having significant potential to change practices across a variety of sectors, as it is used to create algorithms that “learn” from experience, usually in the form of exposure to data (Danks, 2014). These algorithms analyze very large sets of data and provide insights from complex patterns in the data that their human programmers often cannot understand.

We should point out the natural tendency to anthropomorphize AI and ML, which may lead the reader toward mistakes of intuition when thinking about the clinical applications of AI. For example, when we say that an algorithm “learns” we are not suggesting that this describes the same phenomenological process that human beings experience when we learn. We also acknowledge that current AI-based systems are not conscious in any meaningful sense of the word, nor do they ever need to be in order to be competent within the narrow constraints of certain highly specialized tasks. Society should not care that clinical AI will be unconscious, nor that it will be incapable of empathy, but rather that it exhibits the computational and analytic capabilities to provide more accurate and precise

We should point out the natural tendency to anthropomorphize AI and ML, which may lead the reader toward mistakes of intuition when thinking about the clinical applications of AI. For example, when we say that an algorithm “learns” we are not suggesting that this describes the same phenomenological process that human beings experience when we learn. We also acknowledge that current AI-based systems are not conscious in any meaningful sense of the word, nor do they ever need to be in order to be competent within the narrow constraints of certain highly specialized tasks.

The author is saying that people tend to think of AI and ML in human terms, which can lead to misunderstanding how these things work. They give the example of saying an algorithm “learns.” What people usually think of when they hear “learning” is not what is happening with the algorithm. The author also acknowledges that current AI-based systems are not conscious and don’t need to be to do their jobs.

Ask a follow-up question...

Explainpaper

explainpaper's (EP) initial summary: In this section, the author describes six examples of how AI is beginning to be used in clinical contexts related to tasks performed by physiotherapists. The examples are video analysis, natural language processing, dexterous robotics, virtual assistants, expert systems, and prediction algorithms. The author's aim is to demonstrate how AI is beginning to encroach on some areas of physiotherapy practice that are not obviously amenable to automation.

Michael Rowe (MR): What are prediction algorithms?

EP: Prediction algorithms are computer programs that use data to make predictions about future events.

MR: Are there any areas of clinical practice that the author has neglected?

EP: The author has only focused on six examples of how AI is being used in clinical contexts related to tasks performed by physiotherapists.

MR: Can you give me more examples?

EP: Some other examples of how AI is being used in healthcare include diagnosis, treatment planning, and disease management.

MR: How is AI relevant for diagnosis?

EP: AI can be used to create models that can identify patterns in data that may be indicative of a particular disease. These models can then be used to make predictions about whether or not a patient has the disease.

EP's initial summary: The text explains how natural language processing (NLP) is being used to generate structured, annotated text from unstructured clinical records. In addition, NLP may soon be used to transcribe and summarize conversations between clinicians and patients. This will enable the automated capture of symptoms, medications, and other clinically relevant information directly into the EHR, lowering the risk of data capturing errors and reducing clinician burnout.

MR: What is the state of the art in NLP?

EP: The state of the art in NLP is that it is being used to generate structured, annotated text from unstructured clinical records. In addition, NLP may soon be used to transcribe and summarize conversations between clinicians and patients.

MR: Why would it be useful to convert unstructured conversation into structured data in the clinical context?

EP: There are several reasons why it would be useful to convert unstructured conversation into structured data in the clinical context. First, it would enable the automated capture of symptoms, medications, and other clinically relevant information directly into the EHR. This would lower the risk of data capturing errors and reduce clinician burnout. Second, it would facilitate new forms of clinical research by identifying patterns and relationships across large databases of patient records.

MR: What will be left for the clinician to do?

EP: The clinician will still be responsible for approving the transcriptions and summaries generated by the NLP software.

EP's initial summary: The text is discussing the development of expert systems that are designed to help with decision making in healthcare. The systems aim to remove sources of human error, but there are ethical concerns that need to be considered. The text suggests that as these systems become more prevalent, the importance of clinicians knowing about conditions will become less important than trusting the system's outputs.

MR: What are expert systems?

EP: Expert systems are computer programs that aim to replicate the decision-making abilities of human experts. They typically do this by storing large amounts of data and using it to generate recommendations or predictions.

MR: Can we use information about the past to make predictions about the future?

EP: Yes, expert systems often use data about past events to make predictions about future events. This can be helpful in many different fields, including healthcare, where accurate predictions can lead to better decision-making.

MR: What if the patient has a condition that doesn't appear in the historical data?

EP: If a patient has a condition that doesn't appear in the historical data, the expert system may not be able to make an accurate prediction. In such cases, it's important to have a human expert involved in the decision-making process.

MR: Can we trust expert systems to hand off to human experts when it is uncertain about the patient's condition?

EP: It depends on the expert system. Some expert systems are designed to hand off to human experts when they are uncertain about

into some effective self-care strategies that students can employ to enhance their learning skills.

Introduction

One of the cornerstones of success for any health professional student is learning how to learn. As knowledge in the health sector continues to grow exponentially, the ability to grasp, understand, and apply new information quickly and effectively is more critical than ever. And while students seem to pay ever-increasing attention to how they study, I'm not sure that as much attention is paid to making sure they're taking care of themselves, and making sure that they're in a good position to learn. In this course, I'm going to explain how habits around self-care, including diet, exercise, sleep, and social relationships, can have a significant impact on your ability to learn effectively.

The role of a balanced diet in learning

The brain needs up to 25% of your daily energy output, so there's clearly a link between diet and cognitive function. To power neuronal firing and synaptic transmission, the brain needs a steady supply of glucose from complex carbohydrates for sustained mental clarity and focus. There's also evidence that foods rich in fatty acids, antioxidants, vitamins, and minerals nourish and protect neural tissue. If you want to ensure that you have adequate energy for the brain, you should prioritize nutrient-dense foods over processed options that contain empty calories, and have regular meals and snacks to maintain blood glucose levels.

A few years ago, I read Michael Pollan's *Food rules* and found it to be a very useful way to think about food and my diet. Pollan outlines three principles in the book. He says we should eat food, not too much of it, and mostly plants. I think everyone should read this book because it takes a lot of complicated research around food and diet, and breaks it down into these simple principles. When Pollan says that you should eat food, he goes on to



Lex

Alternative: Learning how to learn is essential for students in the health profession to become successful. As knowledge in this field expands quickly, the ability to comprehend and apply new information accurately is key. Although students are attentive to how they study, self-care is often overlooked. This course will demonstrate how diet, exercise, sleep, and social relationships can enhance learning efficiency.

Settings



Stats

3,853 words (114 selected)

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Summary

- Increasing evidence of AI in research:
 - As the subject of research.
 - As a tool for research.
- Generative AI remains biased, untrustworthy, and disconnected from reality.
- However, for creative ideation and initial drafting, it has enormous potential.
- Every day we're seeing new AI-supported research platforms emerging.