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Towards Developing AI Literacy: Three Student Provocations on AI in Higher Education

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Abstract: This article reports the reflections of the co-organisers on a recent AI in Higher Education event which was led by students from the University of Leeds and University College London. While academic communities and experts have contributed significantly to the discourse, students' perspectives have so far been underrepresented. Three student provocations are shared which provided the focus of the discussions during the event. The student co-authors present future-gazing visions of the impact of AI in higher education and beyond. Our collaborative reflections highlight that whether we are seeking to bring about desirable, AI-empowered futures, or aspiring to evade undesirable consequences of these new technologies, it will be vital to develop and enhance the AI literacy of students and educators alike in order to make use of it ethically, creatively and critically.

Keywords: AI literacy, higher education, student voices, assessment, creativity and criticality

Highlights

What is already known about this topic:

- AI technologies are already in use throughout society, including emerging applications in higher education.
- Recent developments in Large Language Model (LLM) forms of AI which can quickly generate 'human-like' writing have been discussed as a watershed moment for higher education pedagogy and assessment.

What this paper contributes:

- Discussion of AI in higher education has so far been driven by the academic community, particularly computer scientists and educationalists, but other disciplines and the voices of students have been underrepresented.
- We seek to highlight a range of student perspectives on the use of AI in higher education for learning, teaching and supporting students' learning.

Implications for theory, practice and/or policy:

- In a rapidly evolving landscape, both staff and students in higher education will need to develop enhanced AI literacy in order to make responsible, ethical, critical and creative uses of AI.
- As higher education institutions move to develop frameworks and policies to govern and promote acceptable and responsible use of AI, staff and students must work in partnership.



Introduction

Once the purview of science fiction authors such as Isaac Asimov, the inventor of the 'Three Laws of Robotics' that would prevent humans from being harmed by their creations (often spectacularly unsuccessful) in his novels, Artificial Intelligence (AI) describes suddenly-mainstream technologies which apparently replicate human thought. There are scientific tests such as the Turing Test (created by Alan Turing) to see if a computer is genuinely self-aware, not just a complex algorithm of machine learning. We aren't at that point yet, but the generative AI we are utilising today is becoming increasingly sophisticated, drawing upon data points numbering in the billions, and represents a vast difference from the original coding developed by pioneers such as Ada Lovelace, Grace Hopper and Margaret Hamilton. In particular, Large Language Models (LLM) have hit the headlines in recent months due to the 'wow factor' of the large chunks of plausible text they can instantly generate in response to prompts. This has driven much commentary from academics and media sources speculating on the impact of these technologies on higher education, particularly in the arena of assessment, but thus far, the perspectives of students have been much less discussed.

We must acknowledge that, as Southworth et al. (2023, p. 2) state, "our society is more digitalized and automated than ever before. We will have to understand what AI is, and how it works to succeed in this new digital paradigm". Educators have expressed both excitement and concerns about the future (Bozkurt et al., 2023). While AI has the potential to revolutionise the way we learn and teach, there are also worries about the implications of this technology on the job market and the value of human interaction in education and creativity. However, Eaton (2023, online) argues that "Human creativity is enhanced, not threatened by artificial intelligence. Humans can be inspired and inspire others. Humans may even be inspired by artificial intelligence, but our ability to imagine, inspire, and create remains boundless and inexhaustible."

Recent conversations on the topic have highlighted indeed a number of opportunities that AI could bring to HE, such as personalised learning, intelligent tutoring systems, and the automation of administrative tasks and there is evidence that suggested that AI is not something that may become relevant sometime in the future but that is used already by educators (Gašević et al. 2023) and related ideas of using AI in Education are also crowdsourced (Bozkurt et al., 2023). Educators recognise the need to stay up-to-date on the latest developments in AI and adapt their teaching practices accordingly. They are also exploring ways to incorporate ethical considerations into the design and implementation of AI-based solutions for education with care and responsibility (Sabzalieva & Valentini, 2023). In short, the impact of AI in HE is a complex and multifaceted issue that requires ongoing dialogue and informed decision-making. In the next section we share three provocations by each of the student co-authors of this piece, considering the evolving role and impact of AI in learning and assessment.

Education and generative AI

Generative AI has gained significant attention in the field of education, offering new possibilities and creative ways for personalized and interactive teaching and learning experiences that promote the holistic development (physical, social, psychological, academic) of the individual. While concerns have been raised about AI taking the place of human in the educational community, it has been acknowledged as a tool to enable humans work effectively and efficiently to increase productivity (Gate, 2023). Bozkurt (2023) explores the paradigm shift brought about by generative AI powered conversational educational agents (CEAs). The author emphasizes the transformative potential of CEAs in facilitating engaging and interactive learning experiences. CEAs enables students to engage in natural conversation without the fear of being judged, providing assistance and feedback for students to critically analyse to increase their understanding and knowledge retention. In similar vein, Atlas (2023) presents a guide to using generative AI, specifically ChatGPT, in higher education and professional development. The author indicates the capacity of ChatGPT to engage learners in responsive and dynamic conversations. AI can help create educational materials that are diverse, inclusive, and reflective of students' social and cultural backgrounds. By incorporating content that represents various perspectives and cultures, we

are fostering a sense of belonging and promote engagement by making learning materials relatable and meaningful (Hockings, 2010). Generative AI can also be used to create new forms of assessments that require students to apply their knowledge and skills in a real world context thereby preparing them to be productive in the world of work and improving their mental well-being (Hunt et al., 2018). For example, AI can be used to create assessments that require students to design something new or solve a problem which are important skills individuals need to survive and succeed in the world of work.

Research conducted by Crawford et al. (2023) addresses ethical considerations associated with generative AI in education. They argued that as educators integrate AI technologies into the learning environment, ethical leadership becomes paramount. They emphasize the need for responsible implementation, character assessments, and ethical decision-making process to ensure the ethical and responsible use of AI in educational contexts. Moreover, Harari (2023) provides a broader perspective on the societal implications of AI and its impact on education. While not specifically focusing on generative AI, Harari's work highlights the necessity of critically examining the ethical dimensions of AI integration and the implications on the operating system of education and human civilization as a whole.

Research settings

In order to consider the potential benefits and implications of AI in higher education, the authors (two staff members and one undergraduate, one postgraduate and one doctoral student, from the University of Leeds and University College London) collaborated to produce an online event focusing on student perspectives regarding how AI can be utilized to enhance academic performance and well-being. The students created three provocations highlighting their desires for the implementation of AI in various areas of higher education. The provocations particularly emphasize the potential role of AI to foster student engagement, personalize learning experiences, and promote well-being. The event took place in March 2023 during Open Education Week and attracted 107 participants, educators and students, from the following 17 countries: Algeria, Australia, Canada, China, Colombia, Germany, Ghana, Greece, India, Ireland, Italy, Pakistan, Sudan, Taiwan, UK, USA and Uzbekistan. The event included invited attendees who responded to the provocations and participant questions, as well as a wide-ranging discussion in the chat amongst the attendees.

Our research approach is focused on envisioning possibilities for educational futures from situated perspectives, rather than on extensively reviewing existing literature in the field. While it is not a collection of speculative fictions *per se*, it is therefore aligned with such approaches, exemplified in the work of Bozkurt et al. (2023). Here, our narrative inquiry is based on the authors' collaborative reflection on the three student provocations (included below), and conversation with the event participants, in order to gain new insights into emerging thinking (Clandinin & Connelly, 2000).

Three provocations on AI in higher education

ST: ChatGPT is the first wave of the future, let's embrace it

For years universities have relied on essays to assess our understanding as students. The topic is set for us by our lecturer, then the essays are written by us in privacy then marked by our lecturer. I do think it has been a useful tool, as it allows us to show our understanding as well as where that understanding has stemmed from through citations and references. Personally, I relish the challenge essays provide me, though I don't particularly enjoy writing in an academic style, which can cost me marks rather than just displaying my knowledge.

However, not all students see it this way. Some see it as a mechanism standing between them and their grade, the grade and the qualification it unlocks is what's important to them, not the content. As the essays are done in private, away from the eyes of their educators those students have no qualms about cheating to reach their goal. This is so common it is frequently used as a story hook in popular media.

Be it through academic malpractice by working alongside others, the lucrative essay writing industry, or just plain old plagiarism. They personally won't be questioned on their knowledge; it's written in the essay so it's assumed they must know it in order to have written it. It is one of the pitfalls of the academic essay as it currently stands. ChatGPT opens what was formerly a method just for those with money – the paid for essay writing – to the world at large. It's also the worst piece of software students will use; it'll only get better and more refined from this point on. Also, there is perhaps now an opportunity to rethink assessment. The QAA (2023), for example, calls on educators to consider authentic and innovative assessment strategies that could be developed in collaboration with their students, while Zhai (2022, p.1) notes that "... new formats of assessments are needed to focus on creativity and critical thinking that AI cannot substitute."

Rather than fighting AI, I say we should embrace it. Why not encourage ChatGPT use as part of the initial draft of assignments. Use it as we already use Wikipedia and Google scholar. The only difference between them is placing it within sentences and paragraphs for students. Currently the bot, ChatGPT for example, isn't good at citing its sources but that will also change over time as the tools become more advanced. Have us submit our ChatGPT response, and then submit our own response to the question, informed from that initial one. Gauge our understanding by seeing how we make that AI generated script into our own. We can add our own experiences, our own study and cited references to back up, or indeed to counteract what ChatGPT has generated. This can lead to increased critical thinking skills and the ability to write clear arguments. It would also encourage us to include viewpoints that don't necessarily match our own, giving a broader academic approach to our understanding. Alternatively, instead of writing our arguments in essay form we could do it through a viva style approach. For this to work we would need lecturers with a deep knowledge of the subject capable of asking us probing questions and knowing whether we are correct or not. In this age of AI it would secure the role of the lecturer as necessary, which we recognise as being a worry.

That is one method and I'm sure people far better at pedagogical application than I can see how to refine and expand it into a workable model. As students we see this as a unique opportunity for educators to get in ahead of a world-changing technology and teach us as students how to use it constructively, to prepare us for the realities of the world we'll be entering where these tools will become omnipresent. We will be using the tool; it will become something commonplace. This will be challenging, change often is, particularly large and seemingly fundamental changes such as this. The education sector is notoriously slow at taking up new technologies, choosing to stay with tried and tested methods. I say let's not run away from it, not waste thousands trying to build detectors that the machine learning of the AI can outpace. Let's find a way to make it integral to our assessments and in doing so give us an incredibly powerful tool, whilst maintaining the essay, just in a new form.

MB: Use AI to increase overseas students' confidence and wellbeing

AI has emerged as a transformative technology with significant implications for various sectors, including education. The advent of AI, particularly generative AI, has introduced novel opportunities for the development of conversational educational agents (CEAs) that can engage in interactive and personalized learning interaction with students (Atlas, 2023; Dwivedi et al., 2023; Pataranutaporn et al., 2021). These generative models have the ability to create original images and voices which make conversation more natural or human-like. AI tools such as Chatbot, Woebot have been established as helpful in self-counselling (Osimo et al., 2015) and reducing anxiety and depression and thereby improving well-being (Michalos, 2014).

Studying abroad is a life-changing experience that exposes international students to different cultures, languages, and educational systems. While this can be an exciting and enriching experience, it can also be a daunting and challenging one. International students often face several obstacles when adapting to a new environment, such as homesickness, language barriers, financial constraints, and cultural differences. These challenges reduce their confidence level which eventually affect their wellbeing.

Individuals' confidence, also referred to as self-esteem (Fairlamb, 2022), and wellbeing (Cobo-Rendón et al., 2020) are established as one of the most underlying factors to achievement.

Although universities offer support services to help international students navigate these challenges, they may not be sufficient, given the range and complexity of issues that students encounter. This is where Artificial Intelligence (AI) chatbots can be leveraged to provide personalised assistance and increase communication confidence and improve wellbeing among international students in order to close the gap (Atlas, 2023). Reflecting on my personal experience as an international student and the impact of Covid-19, I had a first-hand experience of how AI chatbots can make a difference. During my participation in an Edubots webinar, I had the opportunity to initiate a chat with an AI and received instant answers. The ability to have access to support and information at any time of the day, without worrying about language barriers, reduced my stress levels and improved my confidence and overall well-being.

The use of AI chatbots in providing support to individuals has been a topic of discussion in recent years (Meng & Dai, 2021; Nadarzynski et al., 2019; Zhang et al., 2020). While some argue that the lack of human interaction may result in a lack of empathy (Lou et al., 2022), Miner et al. (2017) indicate a growing utilisation of chatbots (such as Woebot and Wysa) in offering mental health services and having compassionate interactions with non-clinical groups and improve individual's emotional support (Erel et al., 2022) and psychological outcomes (Shenk & Fruzzetti, 2011).

One of the key advantages I have personally encountered using chatbots is the instant feedback and assistance they can provide. I received answers to my queries and concerns quickly, without having to wait for a human to become available. This brought about a lot of relief, confidence and performance. Research conducted by Yang and Shulruf (2019) indicates an increase in Chinese students' performance and self-assessed confidence. This advantage can be particularly helpful for international students who may have limited support networks in their new country of study.

Furthermore, AI chatbots can help overcome language and cultural barriers that may exist in traditional support systems. International students may struggle to express themselves in a new language or feel uncomfortable seeking help from someone who is not from their cultural background. AI chatbots, on the other hand, can be programmed to understand a variety of languages and cultural nuances, making them a more inclusive and accessible source of support (Ernst et al., 2019).

By being available 24/7, AI chatbots can also reduce the barriers to seeking help. Many students may feel uncomfortable seeking help during regular business hours, especially when support is needed most. The availability of AI chatbots means that students can access support whenever they need it, regardless of the time of day.

Having mentioned the positive impact of the use of Chatbots on my confidence and wellbeing, and why our institutions should consider implementing Chatbots in students' portal, it is also important to indicate the need to have a basic understanding of AI and its capabilities and limitations in order to utilise it effectively and efficiently, especially with the different cultural backgrounds and language skills. AI literacy refers to an individual's ability to understand and critically assess the use of IA-based technologies (Long & Magerko, 2020). Institutions can ensure that international students adequately benefit from the use of Chatbots if implemented in students' portal by providing resources and training to help them acquire the requisite skills.

In conclusion, implementing AI chatbots in students' portals is an innovative approach to pastoral care that can support international students and promote equity, diversity, and inclusion in Higher Education. Universities can leverage this technology to provide personalised assistance and tools that can help international students succeed. However, it is crucial to ensure that international students develop AI literacy skills to use these Chatbots and other AI technologies effectively and efficiently.

RL: The double-edged sword of AI in education

Undoubtedly, as seen in the other provocations, AI is revolutionary, having the potential to streamline administrative tasks and enhance the pedagogical process, as the introduction of the worldwide web did all those years ago. Some similar concerns perpetuate - such as issues on employment or misinformation, but if the trend of the internet is anything to model off on, we can say that the education landscape is going through yet another industrial revolution and that the people within it will just have to adapt and incorporate these advancements. Thus, I advance my provocation on a point of balance - how can we strike an equilibrium between the creativity and sustainability of using AI?

AI provides many solutions to existing problems within the HE industry. One such example is that by analysing data on student performance and behaviour, AI systems can provide tailored recommendations for further study or even provide insight into students' learning patterns and preferences, tackling the very problem many education systems currently labour under - an overly standardised metric of teaching and assessment that before this, was too cumbersome to personalise on a large scale.

Other examples of AI supporting students include:

- Helping students overcome writer's block: Generate suggestions for sentences or sentence frames when students are "stuck."
- Provide accommodations: Serve as an accommodation for students with special needs. Students could use it to modify texts, summarise readings, or assist with writing.
- Translate: Translate texts across different languages.
- Act as a tutor: Act as a one-on-one writing tutor. Students could ask ChatGPT questions about texts or ask for feedback on their ideas or their writing.
- Edit writing: Serve as a more comprehensive alternative to current editing tools (e.g., spellcheck, Grammarly).

Yet, the concerns of implementing AI in HE is valid. From the educator's standpoint, its impact on academic integrity and assessment design must be carefully considered (Foltynek, 2023). Through the lens of a learning student, AI's potential to dominate the process of attaining information presents a threat to the "productive struggle" of actual learning - with software like ChatGPT hiding the true status of a student's knowledge or ability. Such was expressed recently by Stanford's Human Centred AI research on Generative AI.

Initially, the new wave of generative AI (e.g., ChatGPT, DALL-E) was treated with caution and concern. OpenAI, the company behind some of these models, restricted their external use and did not release the source code of its most recent model as it was worried about potential abuse. OpenAI now has a comprehensive policy focused on permissible uses and content moderation. But as the race to commercialise the technology has kicked off, those responsible precautions have not been adopted across the industry. In the past six months, easy-to-use commercial versions of these powerful AI tools have proliferated, many of them without the barest of limits or restrictions.

Another issue with the use of AI in learning is the possibility of *unintentional bias*. AI algorithms are only as unbiased as the data that is fed into them, and if that data contains any inherent biases, those biases will be reflected in the results. For example, if an AI system is trained on data that contains gender biases, it may produce results that favour one gender over another. Thus, we must also be aware of the potential for AI to reinforce existing biases and perpetuate inequalities. In the same thread, misinformation is prevalent as AI software learns from existing data sets which are not always correct, and the convincing way software like ChatGPT produces its answers can be very misleading. If tools like ChatGPT were a tutor, then the threat of misinformation can be devastating to students relying on it.

Another factor to consider is the impact of AI on *employment* in the field of education. As AI systems become more advanced, there is a risk that they could replace human educators in certain roles, such as grading or providing feedback. While this may lead to increased efficiency and cost savings, it could also have negative implications for *job security* and the *quality of education*, being mindful of the potential for AI to *diminish the role of human interaction in the learning process*.

To avoid these pitfalls, first, AI developers and policymakers must distinguish between the significance of foundation models in educational versus professional settings. Then, they must work together, along with industry players, to develop community norms. This isn't new ground. Look to bioengineering, where the leading researchers, such as Jennifer Doudna, developed norms around the appropriate use of CRISPR technology. For AI, that would mean companies establishing a shared framework for the responsible development, deployment, or release of language models to mitigate their harmful effects.

As we navigate the integration of AI in higher education, it is crucial that we prioritise open communication and collaboration between educators, students, technologists and policymakers. By working together in advocating for policies and regulations that prioritise ethical and equitable uses of AI, we can ensure that AI is used to enhance, rather than replace, the human elements of education.

Discussion: The need for AI literacy

The concept of AI has come to most of us through speculative fictions which imagine futures when machines will not only become self-aware, but more intelligent than human beings, when humans will need to consider ethical dilemmas around whether such intelligences have a right to personhood, or else those machines will determine whether humans should continue to exist. The dilemmas of the present, posed by compelling mimicries of intelligence, perhaps don't lend themselves to equivalent drama, because they were already with us. Technological ubiquity, information abundance and productivity assistants have already been transforming education. Technology companies have long been hyping their latest or forthcoming offerings as disruptive game-changers that will revolutionise or collapse whole industries and business models. But the pace of change appears to be quickening, and the potential impact seems significant. We must therefore look not only to what might be in a distant future but also to more mundane, recent experience for guidance, as we consider how to respond to AI's threats and opportunities.

The three provocations illustrate the opportunities the students have identified to use AI ethically, creatively and with transparency. They don't think it is wise for educators to shy away hoping that AI will just go away. It will not. It is already part of learning, and educators use it too. So, we need to learn to live with it and learn with it. We can see the potential of AI for supporting learning. AI could become a valuable study buddy for example and complement existing support strategies in place by institutions. Bozkurt (2023) highlights the importance of harnessing AI technologies to enhance educational outcomes and improve access to quality education (Gates, 2023), as AI agents have the potential to transform the educational landscape by offering personalized and adaptive learning experiences. Our experience with it shows that it can also be useful for international students and other students, for example to develop confidence in writing and get feedback on early drafts. We are aware of ethical questions around biases baked into AI outputs, as seen in other cases of big data being put to commercial use (Atenas et al., 2023). We also know that not everything that we get from ChatGPT for example is as it seems. The recommendations by the European Network for Academic Integrity (Foltynek, 2023) provide a valuable starting point as these illustrate individual and collective responsibility and provide clear strategies towards the ethical use of AI. Developing critical AI literacy and using AI ethically will be paramount to harness the creative opportunities. Establishing frameworks for responsible use of AI so that higher education, students and educators, and the wider society and those who need it most can benefit and truly become a tool for collective prosperity and growth.

In light of the various reforms being implemented, policy makers, educators and students have come to the realisation that incorporating AI into traditional HE is essential in order to keep up with the rapidly changing world and create a more equitable, diverse and inclusive education system (Southworth et al., 2023) but most educators and students do not yet have adequate knowledge and skills to use AI efficiently (Long & Magerko, 2020). AI literacy refers to the ability to understand, work with, and critically evaluate AI and its applications (Laupichler et al., 2022). This includes knowledge of the basic concepts, algorithms, and techniques used in AI, as well as an understanding of its potential benefits and risks. AI literacy can help individuals make informed decisions about the use and development of AI and can also prepare them for future careers.

Improving AI literacy requires education and training in relevant concepts and skills, such as mathematics, statistics, programming, and data analysis. As AI continues to play an increasingly significant role in many industries, developing AI literacy will become an important aspect of digital literacy.

Some important topics related to AI literacy include:

- Ethics and bias in AI: the potential ethical issues and biases that can arise in the development and use of AI systems, generating references for generated data.
- Human-AI interaction: the ways in which humans and AI systems can interact and collaborate effectively.
- Natural language processing: the ability of AI systems to understand and generate human language.
- Machine learning: the process by which AI systems learn from data and make predictions or decisions.
- Neural networks: a type of AI model that is designed to mimic the structure and function of the human brain.

The potential of artificial intelligence (AI) in transforming our lives in many positive ways, such as virtual assistants, personalised recommendations, and fraud detection in banking. However, it also raises concerns about the impact of AI on jobs and education, the need for fairness and transparency, and the importance of aligning AI with ethical values. By addressing these concerns, we can harness the power of AI to create a better future for everyone.

Conclusion

This inquiry captured emerging thinking around the importance of AI literacy and its importance for educators and students, based on reflections on the online student-led panel event around AI in higher education in March 2023 which was organised by educators in two higher education institutions in the United Kingdom. Our reflections illustrate the importance of understanding and critically and ethically engaging with AI tools and practices. We suggest that educators should engage in ongoing professional development to stay up to date with developments in AI. This will enable them to adapt practices to benefit learning and develop academic skills. Encouraging students to seek relevant resources and development opportunities will enable them to use technologies responsibly and make informed decisions. Learning (and teaching) both with and about AI will both be vitally important elements (Holmes et al., 2022). By actively involving students in the discussion and decision-making processes related to AI integration, universities can ensure that the use of AI aligns with the needs and aspirations of their diverse student body. Educators and students could experiment to make use of AI and together, co-create an inclusive and student-centred framework for appropriate use of AI for educational purposes. As institutions develop, review and implement frameworks and policies to govern the use of AI in higher education, involving both educators and students will help to ensure that AI is used responsibly, ethically and in a manner that aligns with the needs and values of the educational community.

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