Foreword

When the rhythm of the music changes, the dance step must change also

Tony J. Mays
Director: Education
Commonwealth of Learning
Burnaby, Canada

Introduction

When Prof (Professor) Geesje van den Berg first informed me that they were working on a book about AI in education, I was thrilled, as discussions surrounding technological innovation are often dominated by the discourse of the Global North, meaning that the voices from the developing economies of the Global South are insufficiently represented. When she later invited me to contribute a foreword, I felt both honoured and intrigued to be considered, as there are many individuals undertaking pioneering work in this field who might offer a more unique perspective. However, Prof Van den Berg and I have known each other for many years, having collaborated at UNISA on an interim educator qualification called the National Professional Diploma in Education, and subsequently on a Master's programme in open and distance learning (ODL), as well as having contributed to the same textbook on Curriculum Studies. Therefore, I was confident that the new publication would be something to eagerly anticipate.

I also have a longstanding interest in the use of technology, particularly, though not exclusively, in the provision of ODL. As noted in a recent keynote presentation for UNISA (Mays 2024a) several years ago, I worked with a large group of out-of-school youths aged around 23 who had completed their matriculation but were unable to pass a standard industry mathematics test required for entry-level employment opportunities. We needed

a responsive online platform to motivate these learners to re-engage with mathematics at approximately a Grade 6 level. We opted for Khan Academy, which was already utilising a form of AI (artificial intelligence). Students worked through activities and earned badges for motivation. A dashboard displayed their progress, showing how each small achievement contributed to completing the overall programme. Within minutes, each student was following a slightly different trajectory through the subject content in a manner that would have been difficult for a lone educator in a physical classroom using printed textbooks to replicate (there were more than 100 students in the group). Furthermore, the backend tutor functionality allowed me, as their chosen tutor, to monitor their progress and provide additional personalised feedback as needed. Most of the time, only a small percentage of students required this personalised human engagement. I was very impressed by how the technology enabled me to offer more tailored support.

Now that I am Director of the Education Sector at the COL (Commonwealth of Learning), that interest in technology continues. I believe that the COL has a key role to play in supporting the development and dissemination of useful knowledge in an open way to address practical, theoretical, and policy issues in the use of technology in education provision generally and with the evolving possibilities of Gen-AI (generative artificial intelligence) in particular. For example, as reported in our news stories, the COL recently collaborated with the National University of Samoa to use Gen-AI to develop a virtual tutor, able to answer most recurring questions about the Moodle platform being used (COL 2023). Subsequently, the COL worked with the University of the South Pacific to successfully enhance its Semester Zero induction programme, using similar technology to address both learning management systems and content queries (COL 2024). Learning from these experiences, COL recently inaugurated a collaborative project called 'Teacher-in-the-Loop,' in which several of our initiatives work together to use Gen-AI to help educators develop OER (open educational resources) for STEM (Science, Technology, Engineering, and Mathematics) and TVET (technical and vocational education and training) subjects,

which is not only scientifically accurate but also actively seeks to pre-empt any possible biases, particularly in terms of gender equity. A key proposition of this ongoing project is that although Gen-AI is the tool, the educator makes the final decision on what to use and how.

The COL also recently published the results of a survey indicating that more support was needed for policy development in relation to AI deployment (Paskevicius 2024) – a need which was confirmed by other research (Linderoth, Hultén, & Stenliden 2024; Ratten & Jones 2023) – and followed up on the findings of this report by developing policy guidelines (Mohamed & Mishra 2024). So, our interests are aligned.

In the balance of this foreword, I want to reflect a little on the notion of human intelligence, the evolving field of AI, and some of the practical implications for teaching and learning, and then use these reflections as lenses for my initial engagement with this exciting new publication.

Reflection on Intelligence

The African proverb that heads this foreword offers a pragmatic insight into how to deal with change. This seems like a good starting point because, at least to my mind, change seems central to the concept of intelligence, whether reactive or proactive. Moreover, a publication focused on 'artificial' intelligence presupposes a contrast with 'non-artificial,' presumably human intelligence. Sternberg (2024), writing for the Encyclopedia Brittanica, offers the following definition: '[H]uman intelligence, mental quality that consists of the abilities to learn from experience, adapt to new situations, understand and handle abstract concepts, and use knowledge to manipulate one's environment.'

Sternberg notes that there are various theories about the nature of human intelligence and identifies the following core groups, among others: Psychometric, cognitive, cognitive-contextual, biological, and hemispheric. He also observes that our intelligence/s may change over time. We do not have space to explore all these perspectives here, but it seems useful to include

a short reflection to help explain the complexity. Human beings access information and experiences through their senses, so it is important for us to ask questions like, 'Did I really see what I thought I saw?,' 'Did I really hear what I thought I heard?' and so on. Once we have clarity on these questions, we tend to have an emotional response, for example, 'I don't like that, so I won't engage further,' while a more intelligent response might be, 'I don't like that; why do I not like it? What can I learn by trying to understand my dislike?'

In a similar vein, human beings live in a cultural context and might react to information or an experience by not wanting to engage further because what is said or done and by whom run counter to their own cultural norms. However, they might learn something by consciously examining their own norms and comparing them with those of others. Once we have passed through these initial filters, we might bring to bear our reasoning and logic to examine the information or experience in a critical way to understand it better, and then once we have a better understanding, we will likely evaluate that understanding from the perspective of our own worldview. The point being made is that human beings engage with the world in a multi-faceted way. They also make many daily decisions which are not necessarily based on logic or on an analysis of huge datasets and, in fact, human beings often infer meaning and make decisions based on very limited data. Moreover, human beings make connections between data, ideas, and phenomena that are sometimes not obviously connected at all and often also disparate in form. In addition, we have a strong propensity to imagine that which does not exist, or at least not yet in some cases; so authors like Jules Verne, Isaac Asimov, and Arther Clarke were able to write novels about journeys to the bottom of the sea or to the moon, and about robots and earth satellites, even before such things became possible technologically. Human intelligence (or intelligences) is therefore a complex field, but is the key counterpoint to the current focus on AI.

The evolving field of Artificial Intelligence

Oxford Languages (2024) defines AI as 'the theory and development of computer systems able to perform tasks that normally require human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages.' Although the concept of non-human intelligence can be found in ancient mythology and in a sense, began to seem practicable near the start of the industrial era with the invention of machines like Babbage's difference engine, Scott (2024) observes that what we now refer to as AI has been around for a long time even in the modern era, with a focus on 'programmed learning' in the 1960s and 1970s, which advanced in the 1980s and 1990s into basic personalisation, the development of more adaptive virtual systems in the 2000s, and the more recent LLMs (large language models) revolution which has paved the way for virtual tutoring, chatbots for teletutoring, personalised learning content, automated grading, and automated administrative tasks. As with any new technology, there are potential opportunities, potential risks, and the need for experimentation and discourse (Baidoo-Anu & Owusu Ansah 2023). We also need to learn how best to use the evolving affordances of the technology, including gaining a nuanced understanding of its strengths and weaknesses in different contexts (Bozkurt & Sharma 2023; Cooper 2023; Du, Sun, Jiang, Atiquil Islam, & Gu 2024; Smolansky, Cram, Raduescu, Zeivots, Huber, & Kizilcec 2023).

As Denny, Gulwani, Heffernan, Käser, Moore, Rafferty, and Singla (2024) observe, the appropriate use of AI in an education context requires technical expertise, experience of working with students, and knowing how to deploy technology at scale. It will impact how we teach, design a curriculum, manage assessment, work with OER, and manage tensions such as between homogenisation, creativity, and the personalised/individualised. It will allow personalised, real-time feedback and create more time for human facilitation, but it also raises concerns about data privacy, algorithmic bias, academic integrity, and the need for substantially more educator training (Eke 2023; Nikolic, Daniel, Haque, Belkina, Hassan, & Grundy 2023; OER Africa 2023; Onesi-Ozigagun, Ololade, Eyo-Udo, & Ogundipe 2024).

In the most recent (7th) edition of their research on AI, Perrault and Clark (2024) conclude that AI beats humans on some tasks, but not all, that it can make workers more productive and lead to higher quality work, and also that it can accelerate scientific progress. However, they note the lack of robust and standardised evaluations for LLM responsibility and observe that as people become more aware of what AI can do, they also become more concerned about the implications. This would include concerns related to ethics, curriculum design, continuous learning, and industry alignment, among others (Abulibdeh, Zaidan, & Abulibdeh 2024).

Williamson (2024) observes that while we cannot anticipate all future risks, we know from our past experience that the deployment of new technologies is not a linear process. We therefore need an active discourse between the technology developers on the one hand and educators on the other to pre-empt any unintended consequences.

Overall, this suggests the need for a pragmatic response to use human intelligence and human-made intelligence in a synergistic way. However, some things already seem obvious to implement: We can automate routine administration and teaching tasks; manage a balance between personalised support and over-dependence; support students and educators to use and critique AI responses; focus on more authentic assessment; address cybersecurity and academic integrity issues; make ethical use of analytics; provide ongoing professional development for educators; and be open to trying new things in a responsible and ethical way (Bates 2024; Du *et al*. 2024; Kizilcec 2024; Law 2024; Sevnarayan & Potter 2024; Williamson 2024).

Implications for Practice

As noted in another discussion (Mays 2024b), we need to explore the link between pedagogy and technology and the implications for educators' practice. Having established a framework, we can then explore the possible disruptive influence of AI. We also need to revisit assessment because if we change our assessment, then

other things will fall into place (Rowntree 1987). In this context, we should think of pedagogy as an overarching term meaning the art and science of teaching, realising that it needs to be nuanced for different populations and contexts – for example, for adults (andragogy), for self-directed learning in ODL (heutagogy), and for appropriateness for cultural context (e.g., ubuntugogy from southern Africa). Overall, we should promote the notion of 'open' pedagogy (Bates 2022; Hegarty 2015).

We have no shortage of theories about how people learn, as the interactive map created by Millwood (2021) demonstrates. Despite this diversity of learning theories, we can identify at least four broad approaches: Behaviourist/instructivist, cognitive/constructivist, socio-constructivist, and connectivist. These should not be regarded as mutually exclusive positions – our practice likely draws on all four to a lesser or greater extent at different times. Depending on our perspective, we will then use a particular technology in a different way, for example, the use of instructivist lecture-type videos in xMOOCs (extended massive open online courses) as opposed to the use of videos in cMOOCs ('connectivist' or 'constructivist' massive open online courses) where the video content will likely be scaffolded and presented differently but be augmented by additional applications like discussion forums. How we engage with AI or Gen-AI will similarly be influenced by what we believe about how learning happens.

Given the continuing challenges of the digital divide, we need to adopt a pragmatic approach to the use of technology. In many countries we still need to make provision for content that can be printed and/or shared digitally to a basic device at a Wi-Fi-enabled centre, especially for the more rural areas. We can, however, enrich the core content with, for example, video and audio content – whether using broadcast technology or embedded in an open textbook for students with higher end devices but limited access to the internet. We might then also need a version that is fully online, exploiting H5P (HTML5 package) for interactivity and including online discussion fora, which could have both synchronous and non-synchronous elements, as well as involving social media. As noted in the recently published GEM (global education monitoring) report for the Pacific (COL &

UNESCO 2024), despite challenging contexts, we can and often do adapt technologies to find solutions that are more fit for context – AI and Gen-AI are no exception.

Once we know what we want to teach, why, and how, there is no shortage of technologies to choose from. The latest version of the 'padagogy' wheel, recently updated to include AI (Carrington 2024), provides some examples. However, we should remember the creator's earlier observation that it is not fundamentally about the technology but the pedagogy (Carrington 2015). Bates (n.d.) offers a useful heuristic SECTIONS in this regard.

Stoker (2024), a LINC (logic and information network compiler) instructor for the ISS (international space station) of British Columbia, regularly uses Chat GPT (generative pre-trained transformer) in his work. He notes that it helps him to reduce the time needed for planning, assessment design, differentiation, and analysis of what is working in his presentations and what not, so that changes can be made before a topic is taught again and that over time, working with the application, it has learned what he likes and makes increasingly useful recommendations. Stoker also observes that AI has been used to support learning in multiple contexts ranging from Georgia State University, which in 2013 introduced AI to identify and automate feedback to at-risk students, linking them directly with a human tutor where indicated, to schools in rural India which developed AI tools for tablets to provide feedback to students on their subject-based learning. In both cases, these interventions resulted in improved retention and success. He notes that Singapore even experimented with humanoid robots to provide support for students whose educators were on sick leave. He notes that AI in the classroom can take care of many routine tasks freeing the educator to spend more time interacting directly with their students.

As with all new technologies, AI presents both opportunities and challenges. We should not, perhaps, succumb to the hype of the early adopters, but at the same, we should guard against being overly conservative and deny our educators and students the opportunity to exploit some of the more obvious early benefits. This publication can help us make more informed choices.

Overview of the Chapters in this Publication

This publication is divided into two volumes. In Volume 1, Chapter 1, Garth Aziz discusses the potential use of AI in pedagogies employed in the humanities. The author notes that educators are responsible for preparing students to succeed in an AI-mediated world, but this should not be limited to a pragmatic preparation for employment but should rather foster a pedagogy of care, ethics, and good judgement, while retaining a sense of exploration and wonder. In Chapter 2, Lorette Jacobs and Karin McGuirk explore the changing roles of information professionals in a HE (higher education) sector increasingly using AI, noting the increasingly central importance of this role as part of a wider professional community of practice. In Chapter 3, Erna Oliver identifies the need to work more intelligently and responsibly with AI to foster creative innovation.

In Chapter 4, Johannes Cronjé explores an integrated, process-based framework for writing with AI, but finally suggests that from a posthuman perspective, the focus should not be on the student but on the task. In Chapter 5, Karen Ferreira-Meyers examines the potential role of AI in the instructional design process. The author observes that while AI presents an immense potential for transforming HE, carefully considering ethical, social, and pedagogical dimensions is essential. The author argues the need to foreground cooperation, wisdom, and responsibility as educational values no less important than efficiency or personalisation, and the need to harmonise automation with our deepest humanity. In Chapter 6, Lilia Cheniti-Belcadhi, Mohamed Mitwally, and Asma Hadyaoui explore intelligent frameworks for assessment in AI-enhanced learning environments. They observe that while AI has the potential to greatly improve the accuracy, customisation, and efficiency of assessments, leading to a more adaptable, inclusive, and effective era in education, there are still several concerns that need to be addressed. For example, they suggest that AI assimilation and the processing of educational data pose major dangers to the privacy and integrity of such sensitive information, making student data privacy a critical issue. The authors further suggest that an effective resolution of ethical

concerns requires collaboration among professionals from diverse fields such as technology, education, ethics, and policymaking.

In Chapter 7, Elmarie Kritzinger and Sarah Jane Johnston present a multi-dimensional approach to a digital transformation process in HE. They explore the interplay between key stakeholders, AI drivers, and a systematic process of commitment, strategy, testing, implementation, and evaluation. In Chapter 8, Hiro Saito argues the need to look beyond the economic and work-related potential of AI to consider how AI might be utilised to augment humanity itself in service of greater equity, solidarity, freedom, and inclusiveness, and to accelerate learning and flourishing toward collective wellbeing.

In Chapter 9, Joseph Evans Agolla and Phineas Sebopelo observe that many claims currently being made about the potential of AI are not grounded in empirical evidence and that in the African context, it is necessary to find a balance between various competing interests concerning other developments and the implementation of AI tools in education systems. In Chapter 10, in a related discussion, Phineas Sebopelo and Joseph Evans Agolla then argue that AI technology will generate opportunities for accelerating transformation in education. ODL institutions should therefore strategise on how to leverage AI and new technologies to enhance efficiency, encourage learning, and foster creativity while ensuring fairness and equity. They suggest using AI to reshape students' experiences, enhance assessment, streamline administrative tasks, and personalise learning.

In Volume 2, Chapter 1, Samuel Amponsah, Micheal van Wyk, and Michael Adarkwah call for a more holistic and adaptive approach to academic integrity in the digital age. They suggest that integrating GPT detectors and technological tools should be complemented by a commitment to addressing the root causes of academic anxiety. By fostering a culture of trust, transparency, and resilience, they suggest that we can navigate these challenges successfully, ensuring that the pursuit of knowledge remains a transformative and enriching experience for students.

In Chapter 2, Nicky Tjano argues that there is a need to create an educational future that is both technologically advanced

and morally sound. This involves tackling issues presented by concern about mounting students' dependency on AI, reduced human interaction, communication, and ethical gaps. The author suggests that the journey to maintaining academic integrity in the AI age requires ongoing self-examination, adjustment, and a resolute dedication to the values that constitute the core of intellectual endeavours.

In Chapter 3, Faiza Gani explores the link between AI and QA (quality assurance) in HE. The author notes that the opportunities presented by AI link to QA factors and can improve these factors. On the other hand, there is also a link between the challenges provided and QA factors. Consequently, for QA factors not to be compromised, the challenges presented by AI must be carefully mitigated.

In Chapter 4, Brenda van Wyk and Marlene Holmner trace developments in information ethics through history. They suggest that we are currently at a critical point where the swift progress in AI technology necessitates a proactive and deliberate approach to ethical considerations. They also suggest that the OECD (Organisation for Economic Cooperation and Development) FIP (fair information practice) standards serve as a fundamental framework for safeguarding data and ensuring privacy, which are of utmost importance in the era of AI. These principles, in conjunction with the guidelines for responsible AI, they argue, provide a clear path for the ethical, transparent, fair, and inclusive development of AI.

In Chapter 5, Nicky Tjano unpacks the role of big data, AI, and predictive analytics in education, suggesting that creating hybrid mechanisms for review processes will assist in mitigating risks. He further adds that this can be augmented by introducing new specialised committees to ensure that unfamiliar or too technical research projects related to AI and big data are properly assessed for ethical compliance. These changes mean that educators, research review committees, and educational institutions need to relook at their governance processes, protocols, and policy frameworks.

In Chapter 6, Geesje van den Berg suggests that as AI tools will only get better and more human-like, so HE will have to adapt accordingly. Although Gen-AI has the potential to improve teaching and learning for everyone, the key is finding a balance and using Gen-AI to enhance, rather than replace, traditional educational practices. The author argues that collaboration among lecturers, researchers, policymakers, and students will then be essential to ensure that AI is used ethically and responsibly in education. The goal is to create a more equitable and effective education system that provides students with personalised teaching, feedback, and support by addressing the challenges posed by AI technologies and leveraging their benefits.

In Chapter 7, Geesje van den Berg and Patience Mudau explore the potential benefits and challenges that AI presents from the perspective of educators. They note that from their research, the most prominent benefits identified were that these digital tools can provide individualised, 24/7 guidance and support, and also augment learning content. They also note that these tools can assist with simplifying language, a unique benefit in multilingual contexts. Furthermore, they argue that Gen-AI tools provide opportunities for active involvement and that they can save time and make information and knowledge accessible. However, they note concerns that the technologies could provide biased information, lead to decreased human interaction and lack emotional intelligence. Additionally, it could provide inaccurate information and has a risk that students can over-rely on these tools. They have further identified the risks of plagiarism and data privacy and security as challenges. These guidelines focus on the need for policies and AI literacy training, setting an example and providing guidelines to students using Gen-AI. Another important point is that the Gen-AI tools should complement, and not replace, the human elements of teaching and learning, ensuring a holistic and inclusive educational approach.

In Chapter 8, Elize du Plessis argues the need to reimagine online assessment methods observing that Gen-AI holds immense potential to revolutionise how we evaluate knowledge and skills. From adaptive assessments to automated grading and feedback, these models can enhance student and educator

assessment experiences. However, careful attention must be given to addressing challenges such as bias, reliability, security, and privacy. Collaboration between researchers, educators, and policymakers is necessary to leverage the benefits of LLMs while upholding ethical standards and ensuring the fairness and validity of online assessments. She further argues that academics should investigate Gen-AI, identify its limitations, evaluate its potential applications within the relevant disciplines or teaching contexts, and engage in discussions about all these aspects with students, who are likely already familiar with the technology.

In Chapter 9, Micheal van Wyk explores the issue of academic dishonesty and how it might be prevented. The author suggests that academics must redesign authentic context-based assessment tasks, such as specific case studies, problem-solving activities, project-based learning tasks, and academic writing skills. The research report suggests that education faculties need to update AI policies, provide guidelines, and educate students about AI literacy skills and AI detector tools for the ethical use of Gen-AI tools in teaching and learning. The author argues that this must include developing students' ability to use AI in appropriate ways.

The nineteen chapters in this two-volume publication offer insights into both challenges and opportunities for working with AI in general and Gen-AI in particular. Overall, the argument that emerges is for a reasoned engagement with the evolving possibilities of the new technology, but as Mark Twain is credited with observing, gradual improvement is probably going to be more useful than delayed perfection.

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