

The Gift of Education in a World of Artificial Intelligence

Introduction

I was privileged to provide a foreword to this publication last year, noting then that 'our students stay with us for only a finite period, but their education stays with them for the entirety of their lives'.

I had the opportunity recently when speaking to the Daniel O'Connell School to explore the gift and responsibility that education is. We are fortunate to have an education system in Ireland that is world-recognised, with committed and dedicated staff in welcoming school communities all around the country. But we also face challenges. As Education Minister, my task is to meet the challenges at a system level and to support our school leaders, teachers, parents, and the entire school community to deliver the gift of a nurturing and inspiring education to each and every child.

How we navigate those challenges, including at a macro level, is what will define how well we serve our current and future students whilst they are with us for that finite period. We must face questions like what kind of education do we want to provide to our students whilst striving to equip them for the challenges they face, and will face, in the world at large. Equally, we have to ask ourselves not just what is it we want to teach our students, but how do we teach it and how do we enable our students to demonstrate their abilities.

The OECD report 'Building the Future of Education', published in January 2023, suggests: 'Education shapes the world we live in by developing the knowledge, skills, attitudes and values on which societies rely, forging social cohesion and preparing people to become and remain competent workers and active citizens. . . . education systems foster democracy and the transformation to innovation-oriented knowledge societies.'



Norma Foley TD
Minister for Education

In short, therefore, we ought to be preparing our students to be effective and responsible world citizens. So the finite time we share with them must contribute to their ability to navigate and prosper in the world – not just in terms of work but in society generally, both today and in the future in a world that is evolving rapidly.

One of the many gifts of education is that it can prepare students for the great unknown that is their future – creating, developing, and fostering the skills they need as well as providing them with the fundamental confidence and resilience necessary to apply those acquired skills.

Curriculum – or what we teach – has been described as the stories that one generation chooses to pass on to the next; the known knowledge of the day. We need to continue to evolve our curriculum so that it serves our students’ interests and abilities and equips them for the future. We must make sure we are building the skills and the knowledge that students need. In today’s world we must therefore consider the impact, and critically the potential, of artificial intelligence (AI).

Development of AI

The world, and specifically educators and students at all levels, are on a journey of discovery regarding AI. But AI is not new – so why has it gained such currency in recent months? The answer to that question is simple, but the consideration of the topic is not.

AI has been around for approximately 70 years. In 1950, the pioneering mathematician and computer scientist Alan Turing posed the question as to whether machines could think. In the same year, Claude Shannon proposed the creation of a machine that could play chess. However, many consider the Dartmouth Summer Research Project in 1956 as the birthplace of AI.

The term ‘artificial intelligence’ was coined in a proposal that was written for the Dartmouth conference. One of the authors of that paper was John McCarthy, a Stanford University computer scientist whose father was born in Cromane, near Killorglin in Kerry. He is considered to be one of the founding fathers of the discipline of artificial intelligence. In the late 1950s, McCarthy invented LISP, which became the programming language of choice for AI applications.

Despite the great strides forward made by the likes of McCarthy, there followed an ‘AI winter’ for much of the following 40 years. Then, in the mid-1990s, IBM’s Deep Blue (which played chess) emerged, and in 2015, Alphabet (the parent company of Google) launched AlphaGo, which played the ancient game of Go. Of course, the key difference was that Deep Blue and AlphaGo could not only play these games but also beat human experts in each. So why the hype now?

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Whilst AI has been around for a long time (and we have all been using it in our everyday lives, for example to identify spam mail, in navigation apps, and in online chatbots) it is the emergence of *generative* AI, particularly in the form of large language models such as ChatGPT in November 2022, that has caught our attention. ChatGPT became the fastest-growing app in history, reported to have 180 million users by autumn 2023 and around 1.5 billion monthly visits to its website.

Problems and opportunities

It was the emergence of generative AI in such an explosive way that caused me to reflect in particular on how the assessment reforms in Senior Cycle could best proceed. To assist in further thinking on this, I have asked the State Examinations Commission to undertake research on the implications of AI for the future design of assessment.

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The development of AI technologies is proceeding at an unprecedented rate, according to all of the available commentary. The OECD, in its July 2023 paper ‘Generative AI in the classroom: From hype to reality?’, tells us: ‘GenAI capabilities compared to humans will only continue to improve. It is therefore critical to understand how to tap its potential and address its multiple challenges, including the potential for bias, cheating and plagiarism, privacy and data security issues.’

Also in July, in the paper ‘Generative AI and the future of education’, Stefania Giannini, UNESCO assistant director-general for education, points to the digital evolution over time: ‘I have witnessed at least four digital revolutions: the advent and proliferation of personal computers; the expansion of the internet and search; the rise and influence of social media; and the growing ubiquity of mobile computing and connectivity.’ She goes on to say: ‘Although most of us are all still trying to come to terms with the sweeping social and educational implications of these earlier revolutions which are still unfolding, we have, in the past several months, awoken to find ourselves abruptly entering yet another digital revolution . . . the AI revolution.’

Ms Giannini articulates questions which we must grapple with, including: What will be the role of teachers with this technology in wide circulation? And what will assessment look like? She challenges all of us with the responsibility for shaping education, at the system level and for individual students:

Our education systems often take for granted what the world looks like – and will and should look like. Our formal learning systems are designed to help people develop the competencies needed to navigate and, we hope, thrive in the known world. AI is forcing us to ask questions about the known world . . . that we usually take as a starting point for education.

She warns us that ‘we can no longer just ask “How do we prepare for an AI world?”’, before concluding that ‘Education systems need to return agency to learners and remind young people that we remain at the helm of technology. There is no predetermined course.’ It particularly resonated with me when Ms Giannini notes:

we have numerous precedents for slowing, pausing, or ceasing the use of technologies we do not yet understand, while continuing to research them. The research is vital because it adds to our understanding of the technology and informs us when and how it might be safe to use and for what purposes.

What might sound like caution should not be interpreted as fear of AI. AI offers opportunities for the education sector – for students, teachers, school leaders, and administrators. For example, when used appropriately, generative AI has the potential to reduce workload across the education sector, to free up teacher time, to individualise learning for students, and to generate meaningful and timely feedback for students.

I am particularly interested in how the capacity of AI to support differentiated teaching and learning can facilitate stronger personalisation in teaching approaches to benefit all learners, but particularly non-traditional learners and children with diverse needs. AI can analyse vast amounts of educational data to identify patterns and trends, enabling teachers to make data-driven decisions and adapt teaching strategies. Implemented and utilised ethically and equitably, AI has the potential to improve wellbeing and outcomes for both teacher and learner.

However, we do need to be mindful that generative AI can be inaccurate, inappropriate, biased, unreliable, out of date, and taken out of context. It may also infringe on intellectual property and privacy rights. It has been accused of ‘hallucinating’ facts, but it is worthwhile to remember that all generative AI outputs are essentially made up – a result not of considered examination and analysis of the pertinent facts, but of grouping the statistically most likely words related to a topic. We are likely then to get useful outputs on topics about which there is a substantial corpus of existing knowledge from which generative AI can draw, but the system works less well when asked to generate material on a topic about which there is much less training material available.

If AI algorithms are not properly trained or monitored, they can perpetuate bias and discrimination. This can stem from the AI system having been trained on unrepresentative or incomplete data, or on data that reflects historical inequalities. We hope that these biases will be easily observable in the AI algorithm’s erroneous output and such outputs discounted through appropriate human oversight. It behoves us all, however, to be conscious that such biases can often be very subtle, and that there is a need to be ever-vigilant in order to ensure that biased outputs do not translate into discrimination.

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We also have to be concerned about data privacy and security. The use of AI in education will involve the collection and storage of sensitive student data; it may even involve the digital observation and recording of students. It obviously goes without saying, but is worth repeating, that there is absolutely no room for error in ensuring that, whatever AI application might be utilised, it is in full compliance with the General Data Protection Regulation.

There have been some sensational claims made about potential negative future consequences of fully embracing AI – from Armageddon to ‘learnt helplessness’ arising from an over-reliance on technology. There is, however, an immediate, clear, and present danger in the potential misuse of AI to spread disinformation at a level, and on a scale, not seen before. It is therefore imperative that we prioritise the imparting of digital literacy, critical thinking, and research skills to our students to ensure that they are readily able to identify and combat disinformation.

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Rising to the challenges

History can offer us some lessons in how we can face technological evolution or even revolution, or at least to prove that as the technology evolves, we evolve and adapt our behaviours and, in professional terms, our practice. For example, Plato told us that if people learn to write, ‘it will implant forgetfulness in their souls. They will cease to exercise memory because they rely on that which is written, calling things to remembrance no longer from within themselves, but by means of external marks.’ Equally, the 1979 song ‘Video Killed the Radio Star’ has not proven to be prophetic.

As the world evolves, we must look to how we in education must evolve. Looking specifically at how assessment in Senior Cycle will evolve, a recent consultation paper from the Australian Tertiary Education Quality and Standards Agency gives us parameters that may help us frame our own thinking. It points to the work of Boud and Associates from 2010 in ‘Assessment 2020’ and notes:

assessment acts as a powerful intervention in student learning Good assessment design that allows for ‘rich portrayals’ of student learning is critical. Thus, we take as given that assessment should engage students in learning, provide a partnership between teachers and students, and promote student participation in feedback. These key elements of assessment can then guide how best to consider the role of AI in assessment design.

We cannot deny the existence of generative AI or ignore its potential impacts. One of the gifts of education is to prepare our young people for their future, and that future is one in which we know AI will play an increasing role. Now is

the time to seek to identify the opportunities and to rise to the challenges. The research I have asked the SEC to conduct on assessment specifically will certainly assist how Senior Cycle evolves.

Education is a gift which we received from past generations. We are its current caretakers, and our responsibility is to ensure that the gift lives on in current and future generations of students. But we should not see education as only the curriculum of the past – the ‘known’ knowledge which we acquired – but also as the acquisition of the skills to navigate the world of today and, to the extent possible, tomorrow.