Technological Innovation and Disruption in Education

Ensuring equitable and inclusive education in the AI era

Cornelia Connolly
Associate Professor, University of Galway, and Visiting Fellow, Yale University

Tom Collins
Professor of Education (Emeritus), Maynooth University

Inclusive and equitable access in education has been much discussed in recent years. At the same time, many technological challenges are affecting education, particularly developments in artificial intelligence. Building technological and educational solutions for historically marginalised groups can only result in better outcomes for everyone. This article explores challenges and opportunities we are encountering in preparing for inclusive innovation and designing educational solutions for all.

Introduction

Artificial intelligence (AI) represents a generational shift in technology. In that respect it is reminiscent of other historic shifts, such as the development of the printing press, the introduction of electricity, the emergence of computers in the 1960s, and the introduction of the internet. It is reasonable to argue that such a transformative shift opens an option for generational cohorts heretofore excluded from traditional technology to leapfrog into the new technological dispensation.

Typically, those advantaged in the past retain their advantages in the new era. But many others can also benefit. Mass literacy would never have been possible without the printing press, even if the monasteries maintained their hold on the written word for centuries after its emergence.

In reality, even if the rising tide lifts all boats, the big boats don't get any smaller by virtue of a new technology. Privilege tends to persist and to transfer between generations. So in Ireland, just as the big farmers of the 1950s tended to stay big as tractors displaced horses, we now ponder what AI will do for educational attainment among disadvantaged groups or those previously least successful in the education stakes.

Biases and inclusivity

The likelihood is that AI, left to itself, will further advantage the already advantaged. Each time we design or create, the seed originates from one's lived experience. As AI begins to infiltrate our educational system, there must be a cultural focus on equity and inclusivity. Neutrality in technology, and in programming specifically, is a myth. Data biases are present, and humans who

program have cultural biases – all of which inherently affects the algorithm and propagates societal biases. Education policymakers must therefore ask what intervention, on their part, might level the playing field or support marginalised people to enhance their opportunities.

Key to this is understanding that inclusivity results in better outcomes for everyone. This holds true when designing and building solutions – technological or educational. A simple example is closed captioning. Originally developed for those with hearing impairment, it is now also used by many of us when following colloquial conversations, when others are in the room, or when we can't listen to the audio. Another example is the drop in a footpath designed into pedestrian routes since the 1970s and intended for wheelchair users: it is now essential for baby buggies, skateboards, suitcases, shopping carts, and so on.

AI past and future

In 2023 there has been much conversation about how ChatGPT and AI may affect our education system. AI in education is not new, however. As early as 1966, a program called ELIZA, developed by Joe Weizenbaum, took a line of typed text, looked for certain patterns, and replaced one set of words with another. Nevertheless, we currently teach in an environment surrounded by AI and technology, and as educators we need to be more aware and pay closer attention to the ecosystem of platforms and technologies in which we work. The Academic and Research Integrity Conference this year (University of Galway, 2023) is an example of how we can prepare for the change.

As educators we need to be more aware and pay closer attention to the ecosystem of platforms and technologies in which we work.

AI is hungry for data and dependent on the algorithm and data for its effectiveness. The integrity of assessment practices that have evolved – in some cases over centuries, such as the literature review in a PhD thesis – must now be open to different requirements of verification and authentication. We need to plan and compensate for how AI will increasingly become the engine of education, with student data the oil.

AI is undoubtedly a challenge for educators, but it is forcing us to look for creative and original thought, and not emulate what these systems do – rewording and regurgitating the sources they have been fed. Ultimately the challenge may make our education and academic institutions better in how we empower our students to be more robust thinkers. It may make us more responsive to difference and marginalisation among learners.

When it comes to education for the digital world, policy often confuses computing with computers. Children need to know about computing before they know about computers. If they don't, they assume that computing is what computers do, rather than what humans do, increasing the likelihood that

people will be relegated in a world where AI is preeminent. This thinking most likely underpins Elon Musk's recent statement that AI will create a future where 'no job is needed' and that 'AI will be able to do everything' (Browne, 2023).

AI certainly has the capability to greatly disrupt some of the most elite professions in the Western world, including law, accounting, and medicine. A different set of skills will underpin these professions into the future, skills which could theoretically be more democratically distributed. The purely cerebral knowledge associated with a high-points Leaving Certificate might have less of a premium in a world where AI can do much of what the cerebral disciplines once did. In the future, it is likely that differentiating factors between employees will hinge on personality traits, interpersonal skills, and the application of problem-solving skills to fluid or otherwise uncertain contexts.

Conclusion

In the future, it is likely that differentiating factors between employees will hinge on personality traits, interpersonal skills, and the application of problem-solving skills to fluid or otherwise uncertain contexts.

Our education system is progressing through an era of increasing vulnerability and accountability, aligned with the expectation that all students have equitable and inclusive experiences. A proactive policy focusing on the risks and opportunities posed by AI in the world of education, including access to it, will be necessary if advantages or disadvantages of personal background are not to persist.

Such an approach is likely to emphasise data, digital, and computing literacy from preschool through to post-primary. This can be embedded in the existing curriculum but must be buttressed by a clear, holistic learning pathway on computer science and AI literacy within our ecosystem and at the core of education attainment. We need to develop a shared understanding and strengthen the acceptance of computer science and AI literacy as key competencies for every child, irrespective of race, gender, or socioeconomic background – enabling all the young people of today to become active participants in the digital society of tomorrow.

REFERENCES

Browne, R. (2023) 'Elon Musk says AI will eventually create a situation where "no job is needed"', *CNBC*, 2 November. www.cnbc.com/2023/11/02/tesla-boss-elon-musk-says-ai-will-create-situation-where-no-job-is-needed.html.

University of Galway (2023) Academic and Research Integrity Conference Ireland 2023. 4–6 October, Galway. www.universityofgalway.ie/centre-excellence-learning-teaching/newsevents/integrity-conference/.