Does AI confirm the need to re-set Education in the UK?

– a practitioners' view

If you believe that educators have a duty to develop in learners the skills, knowledge, and values to negotiate the world authentically and to ensure that education leads the application of these technologies and is not led by them then it's time to re-set education.

"If a Machine is expected to be infallible, it cannot also be intelligent" (Alan Turing)

"We first shape technologies then they shape us" (Churchill)

"The future of education is the internet – one giant brain connecting every other brain" (Professor Stephen Hawkin)

Sir Nick Clegg of Meta describes *'a potential revolution in children's education by transforming learning into an immersive, personalised and collaborative experience while fostering critical skills for the digital age.'*

In these scenarios – traditional relationships between teacher and learner could shift to one of empowering learners and supporting different ways of learning.

Artificial Intelligence is upon us, within us and amongst us and its use and prevalence is already increasing exponentially. The human ability to rapidly process huge quantities of data has already been overtaken by the machine. There is no reason to believe that this trend will be reversed. Our social life is AI infused, our online shopping is dependent on it, and the diagnosis and treatment of health conditions has increasing AI involvement. AI has the potential to re-define education and schooling whether we like it or not. Indeed, if we do not take control of (or at least participate in the agenda), the continued relevance of schools and educators as we know them, may be called into question.

In their companion piece '*Education in the UK is in need of a re-set*' Tom Clark, Kathy August and Anthony Mackay said that 'public education needed to acknowledge its present failings and recognize the need for a new vision of the future'. They recognized that wider global societal change accelerated by the pandemic and the pace of technological advance risks leaving learners with no space to grow, to be valued or to flourish as human beings.

This paper will reflect on the three main applications of AI and the implications for schools.

Narrow Artificial Intelligence (ANI) is the specific application to meet a need or to solve a problem. For example, treatment recommendation based on Big Data and the data of the individual patient. Most everyday encounters with Artificial Intelligence involve ANI.

General Artificial Intelligence (GAI) is the development towards more human-like problem solving. Examples include Semantic Image-to-Photo Translation, where realistic images are created to help with healthcare diagnoses.

Deep learning (a sub- field of 'machine learning' technology different of course to Michael Fullan's descriptor relating to academic learning) is based on the development of neural networks and is used to recognize unseen patterns and correlations in unsorted data, gather and classify it, and with continued use, continuously learn and improve. This is a growing application in the field of cyber security where deep learning is used to enhance threat detection, anomaly recognition, and predictive analysis.

In general, however, Artificial Intelligence refers to computer-based systems that currently are capable of performing tasks that have normally required the application of human intelligence to execute them. As the technology evolves, it may be expected that the repertoire of Artificial Intelligence skills will grow to include other cognitive skills. One of the most intriguing things about Artificial Intelligence is not only its potential for sentience but the ability for the algorithm to adapt and change itself, to the point where the algorithm may not be fully understood by humans any longer.

Artificial Intelligence's ability to make decisions based on processed data has likewise proven more efficient than that of a human.

For some time, there have been reactive machines which always generate the same output for a given input. Current developments include the implementation of limited memory machines, which can assist in the customisation of user experience in areas such as cloud-based voice services, search engines, film and music streaming services, and online shopping.

The current 'ne plus ultra' field of Artificial Intelligence examines the theory of mind and self-awareness models, which drift into the area of machine sentience and which ***for now*** is the currency of science fiction.

The difference between Artificial Intelligence and other forms of digital learning tools, is that for most of us AI is a black box. You can't see it or easily bend it to your will. Other digital learning tools such as classrooms display systems, personal devices, 3-D printing, apps, wireless technology, Virtual Learning Environments and networks can actually be seen and actively used. Artificial Intelligence is opaque at best, covered in a veil of mystery (The Shroud of Turing, perhaps?).

Whither or wither the role of the teacher?

If it is valid that any teacher that could be replaced by Artificial Intelligences should be then we really need to defend and promote the unique role of the teacher in learning.

To engage the direct involvement of teachers in the debate we need to demonstrate the potential impact on pedagogy.

At this crucial time, it may be helpful for members of school communities to further reflect on the different kinds of Artificial Intelligence that may be encountered in education.

Narrow Artificial Intelligence (ANI), General Artificial Intelligence (AGI), and Deep Learning which include the use of Large Language Models (LLMs) such as ChatGPT, Google Bard and Microsoft Bing are creating a range of opportunities for students, teachers, and school leaders.

Plagiarism is no longer seen as the biggest threat to the authenticity of text, sound and image production – Artificial Intelligence authored content is.

ChatGPT is, in 2023, the fastest growing app ever developed and could be a catalyst for educational change but with the possible danger of rewarding performance above understanding in matters of homework, course work, or dissertations.

Other Artificial Intelligence applications that are already available and are having a particular impact in education include speech recognition systems, help bots, computer vision capture and analysis, recommendation engines, automated data manipulation and decision making.

Existing uses of Artificial Intelligence in business may help to point the way forward. The streamlining of repetitive tasks, like routine and higher level back-office tasks including finance, procurement, payroll, policies around Health and Safety, safeguarding, contracts ,exam analysis, governance can be speeded-up with less labour-intensive demands on people, thereby freeing-

up time, a precious resource for teachers and school leaders. Aligned with this is an increased efficiency in terms of analysis and output, potentially in the provision of personalised and evaluative online learning systems. Human and other resource could be redirected. But the danger of seeing it as a way of merely making budget cuts or savings will no doubt emerge.

There are a number of problematic factors to consider when thinking about Artificial Intelligence in education. The cost of software development and implementation is always a huge barrier as the levels of investment are not at the same levels as other areas such as medicine, big pharma, and the military. And to adapt training software from other disciplines may not be satisfactory, as the focus is often on training for performative skills and less on higher cognitive development. As the social and economic incentives for investing in Artificial Intelligence are cost reduction and profit, there is always the potential that job losses may occur if for instance it is decided that Artificial Intelligence agents can replace teaching staff.

Two other negatives that may emerge pose serious questions about the purpose of schools. Accidental, or indeed deliberate embedding of bias could have a catastrophic effect on learning – this may already be happening in AI selections for recruitment. An increasing reliance on Artificial Intelligence may also lead to insufficient cognitive challenge, laziness, complacency, or passivity in learning. Short cuts through creativity in music, video, art, writing and other forms of creative expression may lead to an emphasis on the product rather than the creative learning process. This is not to diminish the potential uses of Artificial Intelligence in education, including assistive technology for those with special needs, teacher productivity in assessing, testing, and the provision of targeted intervention but we need to be on our guard

As a society we have an unfortunate tendency towards using digital technologies for the banal, the easy and the soporific. The great movements in digital technologies have led over time to dumbed down usage e.g. the great potential of social media has also led to stupid memes, conspiracy theories, compulsive "doom" scrolling, and a digital diet of "junk food". If social media can control and pacify us then what might AI do? Could it determine what we do and can say and perhaps even what we think – re-read Orwell's '1984' if you dare or perhaps Huxley's "Brave New World" where we are controlled by pleasure rather than fear. At a time of rampant conspiracy theorists using social media to influence how will the truth of the pre-meta verse age be safeguarded? Are we witnessing the beginning of a 'post history' period?

Of course it might be that the future is not cataclysmic but instead just slow and soporific. As Eliot says "this is the way the world ends, not with a bang but a whimper".

There is considerable debate about whether the development of Artificial Intelligences systems should be paused, while we consider their social and ethical implications. Pausing Artificial Intelligence would probably not work in practice and might delay the good work being undertaken at present, for example in the development of medical treatments and strategies for tackling climate change. It would also reduce transparency as development of systems went underground.

On a positive note, however, recent developments in Artificial Intelligence have led to rapid improvements in deep reinforcement learning and Generative Adversarial Networks (GANs). (GANs generate new data based on prior learning and are increasingly able to discriminate between genuine and false data). Other techniques in voice and image recognition are enabling machines to parse and generate language more effectively. If we are still some way off from truly intelligent machines, we are getting closer to machines that will be able to ***simulate*** human intelligence and pass the Turing Test, in which computerised responses are indistinguishable from human responses given to direct questions. This could have profound pedagogical implications and prompt an ethical rethink about how we educate.

To try to control the AI agenda schools should be encouraged to explore new ways of using virtual reality, artificial intelligence, and robotics that might help break down the arbitrary and bureaucratic structures of authority such as those set up for inspection, teacher training, curriculum development and examinations.

We must remember that the great lie is that "digital technology is just a tool" This sloppy statement implies that the tool is passive and value-free. It is not. A good tool (and good usage of it) fundamentally shapes the way in which the user applies it. We are talking about a new world where practices, thinking, and values are changed, even if subtly, by the adoption of any new implement. We should remember that debates around Artificial Intelligence have often focussed on issues about what is real and what is not, as if the online world was different to the offline one. In recent years, however, the two "worlds" have actually converged to the point where, amongst young people, engagement with digital technologies is often inextricably bound up in their human lives, relationships and work. Schools still see "digital learning" as a separate thing.

Combining technologies such as Artificial Intelligence with the philosophical principles of postmodernism, it is tempting to imagine technologies that will further define us, evolve us, and possibly in time destroy us.

We are not alone in our thinking. In their paper "Towards a Digitally enabled Learning Ecosystem (attached) Tom Barrett and Chris Harte state that

> *"Although educational inequities persist, technology can bring the sum of all knowledge to learners' fingertips, connect them safely with experts around the world and allow them to collaborate on real-world challenges"*
>
> *"With their rigid schedules, standardised curricula, and one-size-fits-all assessments, ('learners') are ill-equipped to adapt and grow from challenging new contexts"*
>
> *"AI technologies have the capability to enhance educational support, but they also have the potential to profoundly disrupt traditional educational practices, including standardised assessments. A focus on other literacies including critical and creative thinking, digital literacy, including AI literacy, and more complex competencies like empathy and intercultural understanding, is essential to build the capabilities of young people"*

Questions and concepts for practitioners to consider

- This is the time to reassess what is the purpose of education. We ***need*** a reset.
- How can we ensure that learners will flourish in the future as well as function?
- Traditional relationships between teacher and learner could shift to one of empowering learners and supporting different ways of learning, in itself a paradigm shift, moving the focus from content to skills with learning opportunities being created 24/7 and more widely.

  Chat GPT could lead to every child in the world receiving customized curricula.

  (Professor Stuart Russell)
- Without teachers AI cannot create a curriculum, even less global customized curricula.
- Might an increasing reliance on Artificial Intelligence lead to insufficient cognitive challenge, laziness, complacency, or passivity in learning?
- Will new knowledge only be created artificially and how could it be quality controlled?
- If Tech companies buy their way into the sector might they create a dependency culture? Should we be wary of technology evangelists who have billions of dollars invested in capturing most of, if not all of the education market and shaping if not controlling it?
- Medics are benefitting from AI, improving diagnostics and surgery techniques. How could this work in Education?
- Could today's 'group- think' attitudes and values be programmed into AI and underpin the 'diktat' of compliance leading to even more centralisation and control?

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Tom Clark, CBE, FRSA, Vice-Chair Academy Transformation Trust, was formerly CEO of George Spencer Foundation School and Technology College and Associate Director of the Specialist Schools and Academies Trust. His work internationally has included helping to develop school networks in Australia, the USA and Hong Kong. Having chaired FASNA and the Govnet Advisory Board, he now advises a number of multi-academy trusts and the Association of Education Advisers.

Dame Kathryn (Kathy) August has spent 45 years working in and for public education. She had three secondary headships and has also been a Director of Education in two LEAs, worked as a senior adviser in the DfE, been a visiting professor at Salford Business School and worked as an interim CEO. She became a Dame in the 2014 New Years honours list. Her book *Becoming an Academy School in the UK: With Principal* (Cambridge Scholastic publications) was published in June 2022.